User manual – MPH241/242

MPH series video encoders

H.264 / MPEG-4 / MJPEG / MPEG-2 video encoders
for PTZ and fixed camera networking applications

MPH241 – 1-ch stand-alone video encoder

MPH242 – 2-ch stand-alone video encoder

SD, HD-SDI (1080p)

Contents

MPH series video encoders introduction

Stand-alone video encoder with 1 or 2 video inputs, bi-directional data, audio & contact closure channels + Ethernet switch

General

MPH series encoders are ONVIF (Open Network Video Interface Forum) compliant products. This provides wide interoperability with any ONVIF compliant device or system.

Many similarities exist between the **MPH** series video encoders; the main difference being the number of video channels available and the mechanics. **MPH** series video encoders are high performance video processing products encoding real time video in mission critical applications for customers in Transportation, City Center Monitoring, and Corporate Security. **MPH200** series encoders are temperature-hardened compact size stand-alone video processing products in the **MPX** platform.

MPH200 series video encoders provides in addition to transparent link of **CVBS** or **HD-SDI** video signal up to **1080p** resolution (SMTP292M), independently configurable general-purpose bi-directional asynchronous data, bi-directional audio channels and bi-directional contact closure channels. Additionally a layer 2 manageable Ethernet switch is integrated into the encoder. The Ethernet switch comes with four gigabit ports and full-feature layer 2 switching functions such as RSTP, IGMP, QoS and VLAN.

The encoded signal from **MPH** series encoder can be decoded with **MPC/MPX** (except H.264) or **VMX** series HW and/or SW, as well as with industry standard SW players such as Quicktime and VLC. The transmission is accomplished over 10/100/1000BASE-T or 100BASE-FX (SFP) or 1000BASE-X (SFP) network utilizing IP/Ethernet streaming.

MPH series video encoders are equipped with the **H.264**, **MPEG-4**, **MJPEG** and **MPEG-2** video encoding engine. The default encoding combination is H.264, MPEG-4 and MJPEG. MPEG-2 is an add-on option, and it should be ordered separately.

The **H.264** video encoding engine is compliant with the ISO/IEC 14496-10 (H.264@MP, BP, CBP) standard. The **MPEG-4** video encoding engine is compliant with the ISO/IEC14496-2 (MPEG-4@SP/ASP L5) simple profile standard. The **MJPEG** video encoding engine is compliant with the ISO/IEC 13818-2 (RFC 2435) standard. The **MPEG-2** video encoding engine is compliant with the ISO/IEC13818 (MPEG-2 MP@ML) standard.

General-purpose asynchronous data channels are transferred separately from the encoded video signals.

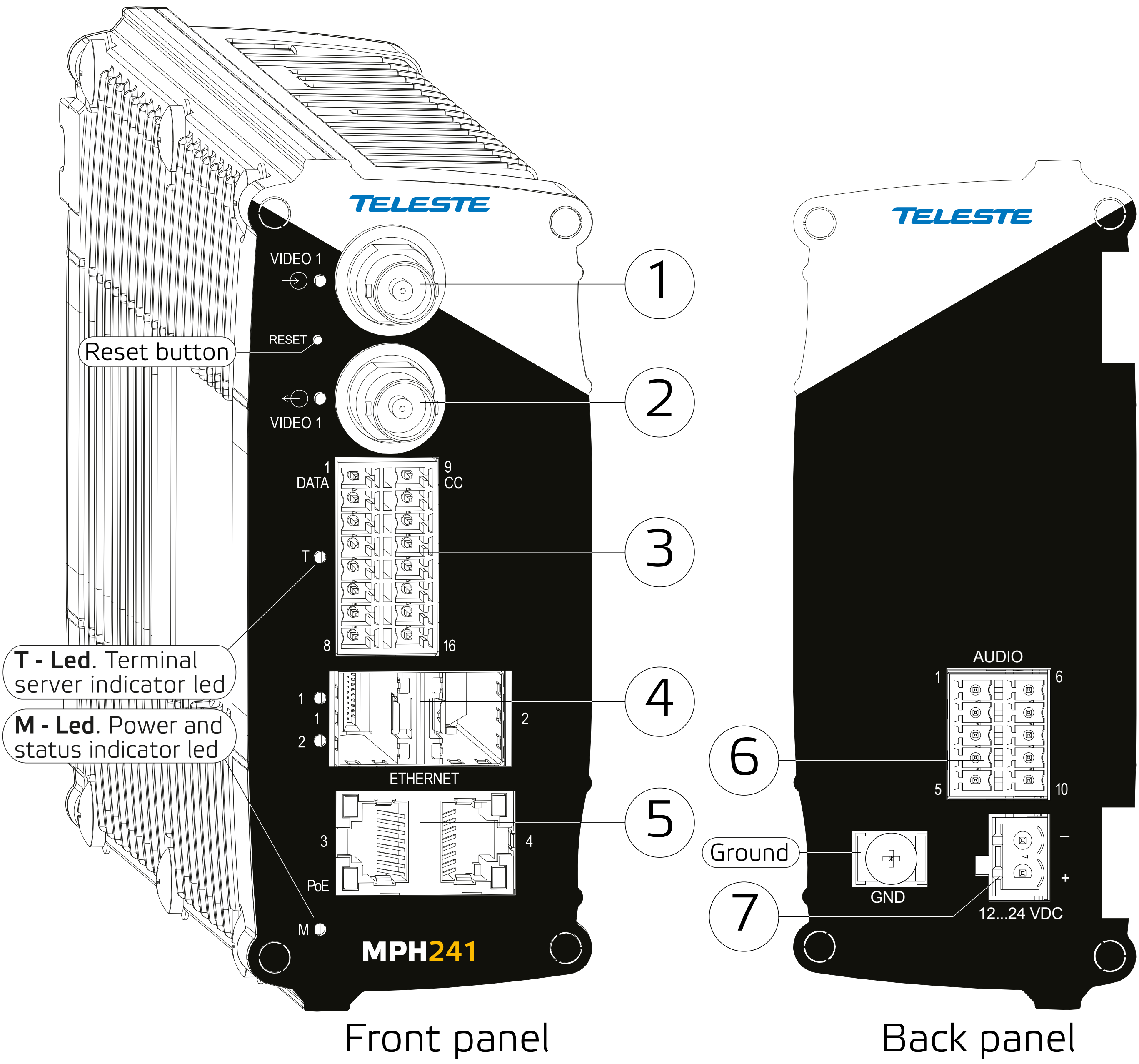
__Note__! This product is under development and Teleste reserves the rights to alter specifications, features, manufacturing release dates and even the general availability of the product at any time.

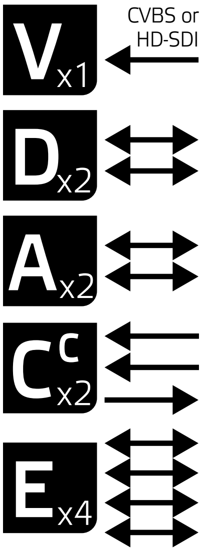
Firmware version

The functionality and operation of the devices described in this manual applies for firmware version **6.0.x**.

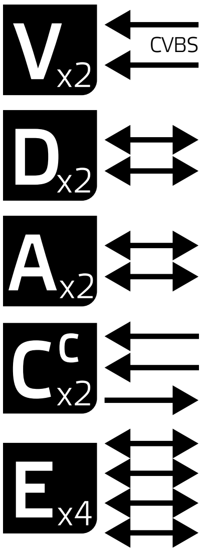
MPH series video encoders front and rear panel

MPH200 stand-alone encoder (example view from MPH241 device)





MPH241 signals.



MPH242 signals.

MPH200 series video encoders mechanical connections

1. **CVBS video input 1**, or optional **HD-SDI** video input (BNC female) and indicator led.
2. **CVBS video input 2** (BNC female) for 2-ch versions or
   Video loop through port for 1-ch versions and indicator led.
3. **16-pin screw terminal block** and T indicator led:
   Data interfaces, EIA RS422/485 (data1), EIA RS232 (data 2) /management interface (CLI) or general purpose serial port.
   Contact closure interfaces (cc input 1, cc input 2, cc output)
4. **Ethernet switch up-link interfaces**, 2 x socket for SFP module (GE, see a product catalogue for supported models).
5. **Ethernet switch local port interfaces**, 2 x 10/100/1000Base-T, RJ-45.
6. **Audio interface** (10-pin screw terminal block).
7. **Power supply** connector (2-pin screw terminal block, +12...28 VDC).
   Reset button: Device software reboot and hard/soft factory defaults restoration (see section Factory reset).
   Ground: Device ground connection.

Led	Colour	Mode
M	OFF / Dark	Power off
	Yellow	Device starts up
	Red	Device self-test failed
	Green	Power on / Device is functional
	Blinking Green	Device is being accessed from any interface. Whenever device is accesed from WebUI, CLI or ONVIF interface, led blinks 2s. During software update, LED will blink throughout the firmware image transfer duration.

M - (module/power led) LED indicator operation. This LED indicates power status, factory reset, interface activity.

Factory reset

The factory reset can be done via **WebUI**, **CLI**, or using the pinhole **reset button** on the front panel of device. There are two types of factory resets; Soft factory and Hard factory reset. The Soft factory reset restores all, except IP configuration to the default factory settings. The Hard factory reset restores all settings to default factory settings.

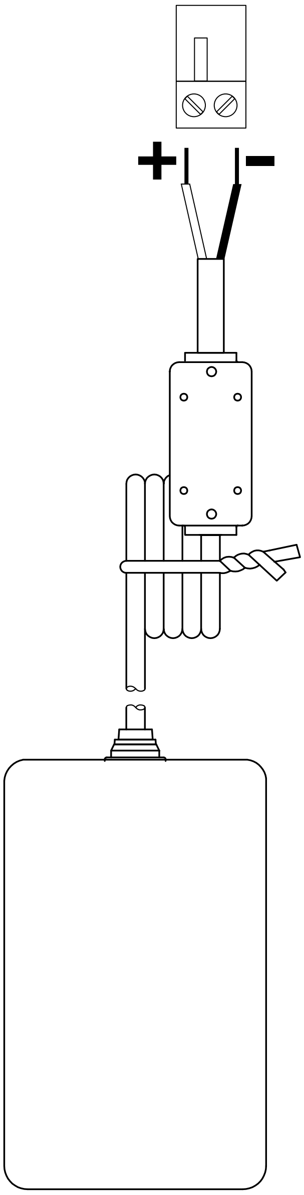
Reset button

The reset pinhole is a button that resets the device to its original default settings. To use this button, insert a stiff wire (such as a straightened paper clip) into the pinhole. If you release the button immediately the device will reboot with current settings. But if you hold the button you can restore the default settings as following table shows.

***Note**! If pinhole button is not released within time window, operation will cancelled.*

Led	Colour	Mode
M	6 x (short) green blinks at boot time	Time window to select Soft factory reset. If reset button is released in this time window, soft factory reset is selected.
	2 x (short) red blinks	Soft factory reset shall be applied. Wait until device has fully started (power led green).
	24 x yellow blinks at boot time (after the 6 green blinks)	Time window to select Hard factory reset. If reset button is released in this time window, hard factory reset is selected.
	4 x (short) red blinks	Hard factory reset shall be applied. Wait until device has fully started (power led green).

Getting started



CPS25x series power supply for **MPH200** device.

Quick instructions

1 Install the temperature hardened stand-alone **MPH200 series** encoder to the installation location. A +12 VDC supply voltage is provided by a **CPS25x** series power supply (see example picture beside), or alternately through the LAN cable (CAT5) when using Power over Ethernet (PoE+) technology.

2 Connect all needed signals to their respective connectors on the device's front panel:

- **HD-SDI** / **CVBS** video signals to the BNC female connector(s).
- **Data** and **contact closure** signals to the screw terminal connector.
- **Audio** signal(s) to the screw terminal connector.
- **Ethernet** network to Ethernet connectors.

3 Switch on the power and wait until the power led "**M**" lits green (start-up time approx. 100 secs). This indicates that the device hardware is operating properly and ready for usage.

Note! *If led doesn't lit green, refer to "M- LED indicator" section to know the status of the device.*

4 Log on to the device using the IP address assigned by DHCP server, or locally from a Mgmt port (CLI) and then set all necessary settings in the device.

Note! *Device uses always two IP-addresses, one for encoder and an another for internal switch management. By default device will automatically assign IP addresses via DHCP. If network doesn't contain DHCP server, then the MPH encoder shall use Zeroconf (link-local) as DHCP fallback (see section below).*

Device's IP address

There are two ways of assigning IP address to the MPH device. The IP address can be automatically assigned via DHCP, or you can set it manually as a static IP address. Factory default IP settings for the device is DHCP enabled.

By default when you have DHCP server in the network, DHCP server assigns an IP address automatically to the MPH encoder. The DHCP server offers an IP address from its address pool when a device is starting up.

If DHCP server is not available device uses zero configuration (link-local address) as DHCP fallback. With Zeroconf protocol MPH chooses an IP address randomly in the IP range from 169.254.0.1 to 169.254.255.254.

Alternatively you can manually assign the IP address, subnet mask and gateway address to the unit.

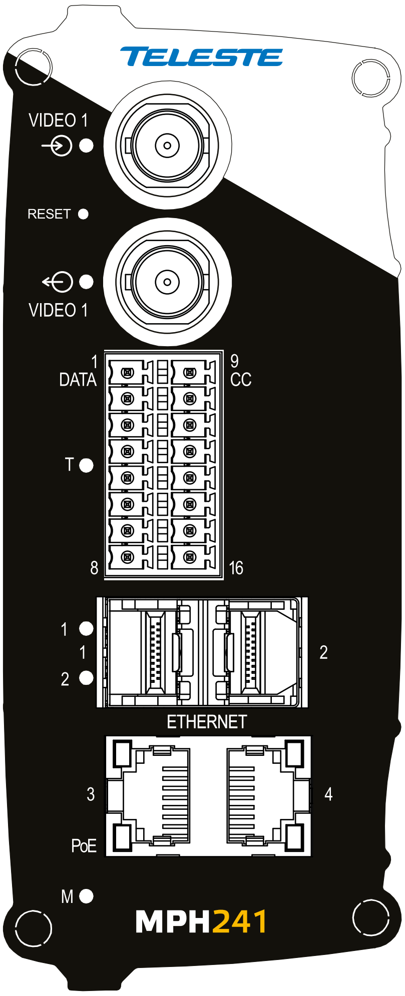
If there is no DHCP address in the network, the unit chooses randomly an IP address from the private IP range 169.254.0.1 - 169.254.255.254. In this case in order to find the chosen IP address you have two options. You can use Teleste MPH Discovery Tool to browse all the available ONVIF compliment devices in the network, note that your PC IP address should be in the same IP range. Second option is, connecting to the MPH device locally via the serial port and use the CLI (Command Line Interface) to see device IP address.

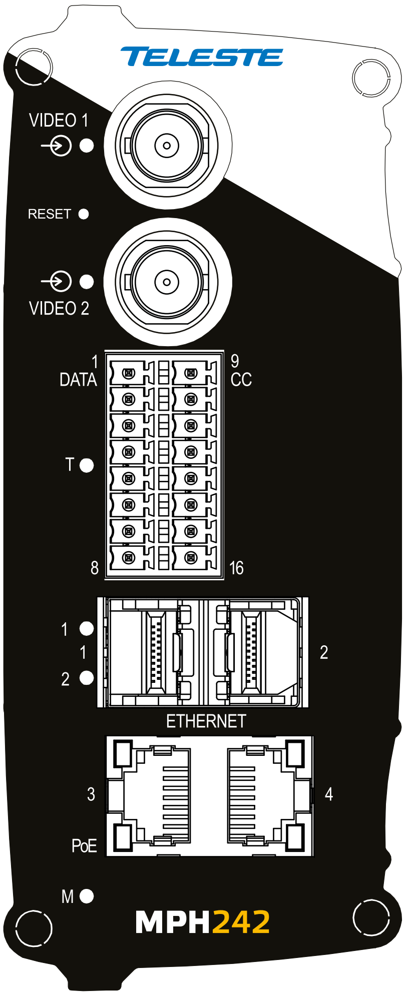
See section **Network command** to see how to change IP address via CLI.

MPH200 series models

One video input (digital HD-SDI or analog CVBS).

Two video inputs (analog CVBS).

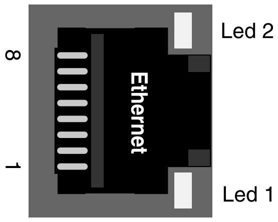




MPH241 encoder supports both digital **HD** (HD-SDI) and analog **CVBS** video formats.

For HD-SDI operation the MPH241 needs to have the HD encoding license MLH213 enabled.

Ethernet interface



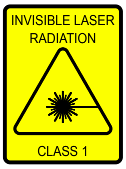
Electrical Ethernet connector (RJ-45).

Led	Colour	Mode
2	Green	Link up
	Blinking Green	Traffic
	OFF / Dark	No link
1	Orange	1000 Mbps
	OFF / Dark	100 Mbps

Ethernet port's led indicator operation (RJ-45 connector).

Led	Colour	Mode
SFP	Green	Link up
	Blinking Green	Traffic
	OFF / Dark	No link

Ethernet port's led indicator operation (when SFP optical connector).



Ethernet connections

The unit has a built-in 4-port managed Ethernet switch and supports both **Fast Ethernet** and **Gigabit Ethernet** connection speeds. Ethernet interface type is either a **fixed electrical** (copper), or has support for a small form-factor pluggable transceiver (SFP) module. Supported SFP transceivers are specified by Teleste. Please see the latest list of available SFP products.

Local ports, electrical interfaces

Device include two (2) fixed electrical Ethernet connectors. The electrical Ethernet connector type is a RJ-45 female. The interfaces are supporting 10/100/1000Base-T operation (Gigabit Ethernet).

Power over Ethernet (PoE+) option

MPH200 series encoders supports PoE standard (PoE+ 802.3at class 4). This means that the encoders can be powered through the LAN cable without the need of individual power supplies. PoE is available from port number three (3).

Requirements for the use of PoE:

- A Power over Ethernet (PoE) compliant switch or hub.
- MLH251 license activation.

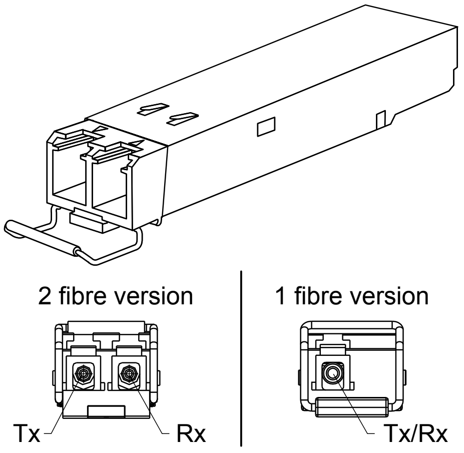
> ***Note***! *MPH200 series device PoE port is only used to powered device itself, it not provide output power to other devices.*

Up-link ports, optical interfaces (SFP)

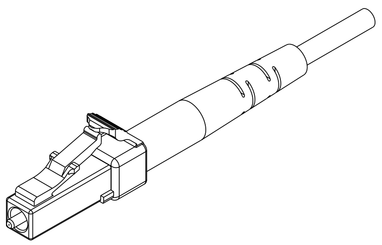
SFP modules for optical Ethernet operation are available with a variety of different types (see the latest list of available SFP products), allowing users to select the suitable module for to provide the required optical reach over the available optical fibre type. The optical connector type is **LC/PC** (single or dual). Ethernet interface speed is 1000BASE-X (Gigabit Ethernet).

When installing the fibre optic cable, do not exceed the minimum bending radius when connecting cable to the system.

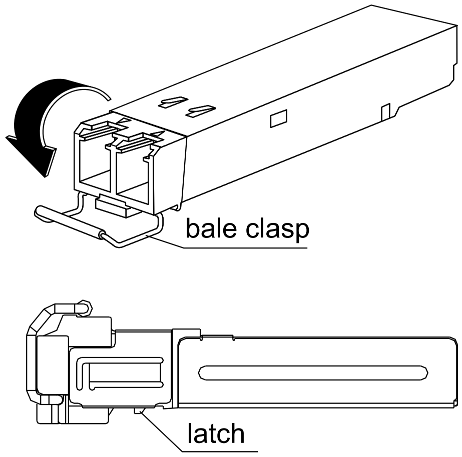
Optical Ethernet connection meets class 1 laser safety requirements of IEC 60825-2: 2004 and US department of health services 21 CFR 1040.10 and 1040.11 (1990) when operated within the specified temperature, power supply and duty cycle ranges.



SFP plug-in optical transceiver module.



Optical connector is the type of LC.



SFP module’s locking release points.

How to unplug or plug-in the SFP transceiver module

If your up-link port requirements change, simply unplug the existing SFP module, and plug-in the new module. **The SFP transceiver modules must be installed before the encoder is powered on**. Installing SFP:

1. Switch off the unit supply voltage.
2. Mount the SFP transceiver to the unit (see bottom instructions).
3. Connect the fibre optic cable(s).
4. Ensure that the remote end of the fibre is already connected to an active switch.
5. Switch on the unit supply voltage.

The SFP transceiver module has a bale-clasp latch that makes easier to install or remove the module. Protect the SFP module by inserting a clean dustplug into the module after you remove the fiber cable. Be sure to clean the optic surfaces of the fiber cable before you plug the cable into another module. When using 2 fibre version SFP, select carefully the correct optical port for TX and RX operation.

To unplug and plug-in the SFP module, follow these steps

1. Open the bale clasp on the SFP module by pressing the clasp downward until it is in a horizontal position.
2. Use a small flat-blade screwdriver or other long, narrow instrument to push on the hinge pin to unlock the SFP cage latch.
3. Grasp the SFP module by the bale clasp and gently pull it out of the SFP cage.

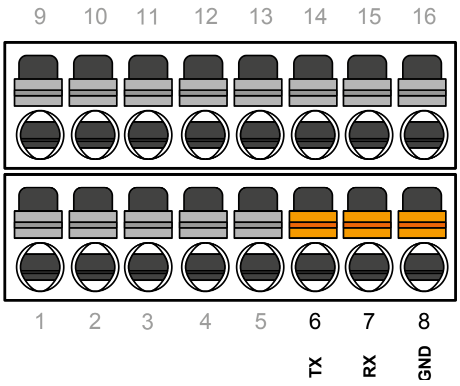
To plug-in the module:

1. Orient the transceiver with the bale clasp on the bottom, close the bale clasp by pushing it up over the transceiver, then gently insert the transceiver into the port until it clicks into place.
   ***Note**! Reboot the device when the SFP is changed.*

Some generic notes for successful optical connections:

- Ensure that the fiber patch cord is damage-free (fiber condition can be easily checked by a visible laser tester)
- Do not exceed the minimum bending radius of the fibre
- Avoid sharp corners on cable shelves and in cable management in overall
- Make sure that correct optical connectors are used
- Open connectors are always secured by dustcaps during maintenance
- Always before mating clean all connectors (wet cleaning by high purity alcohol & drying, or dry cleaning with reel-based lint-free wipes, fiber adapters may require special ferrule end-face cleaning tools)
- Before making any visual inspections ensure that system has been shutdown or no optical power is present
- For fault finding at least a optical power meter is required, a complex fiber cable environment may require use of an OTDR equipment.

Management interface



PC/ PSION	D9 female	Screw terminal	MPH encoder
Receive data	2	6	Mgmt output
Transmit data	3	7	Mgmt input
System ground	5	8	Ground

Local management connection (CLI) and management cable (**CIC506**) pinout (D9 female/screw terminal).

General

MPH encoders support web user interface (WebUI), ONVIF configuration interface and command line user interface (CLI) for various configuration purposes.

WebUI

MPH series video encoders can be fully configured using Web user interface (WebUI). You can access the Web user interface via web browser.

ONVIF

MPH series video encoder support ONVIF (Open Network Video Interface Forum) global interface (version 1.02, Profile S).

CLI – command line interface

MPH series video encoder include a command line interface (CLI) for configuration purposes. The CLI is a text-based interface that allows the user to interact with the operating system by entering commands and optional arguments. CLI is accessible through any terminal emulator application (e.g. Hyper Terminal or PuTTY). The command structure is the same for all session types. A typical CLI usage is to access the device IP address settings. By default the data channel 2 is set for CLI usage. The data channel 2 can be set to normal RS232 data mode with WebUI when needed.

> ***Note!*** *Data 2 channel can be set either general RS232 data transport mode or CLI mode (not simultaneously). The default factory setting is CLI mode (Hard and soft factory reset restores the data channel 2 to the CLI mode).*

Local CLI connection

The **local CLI session** can be establish via data channel 2 by using a serial data connection (RS232) cable (type Teleste CIC506).

> ***Note!*** *Data 2 port must be set to CLI mode .*

Remote CLI connection

Over the IP network you can make Telnet or SSH connection to open the command line interface remotely. SSH protocol secures your data session.

> ***Note!*** *Remote CLI is always available through network, even when data 2 is configured for non-CLI usage.*

Web user interface (WebUI)

General

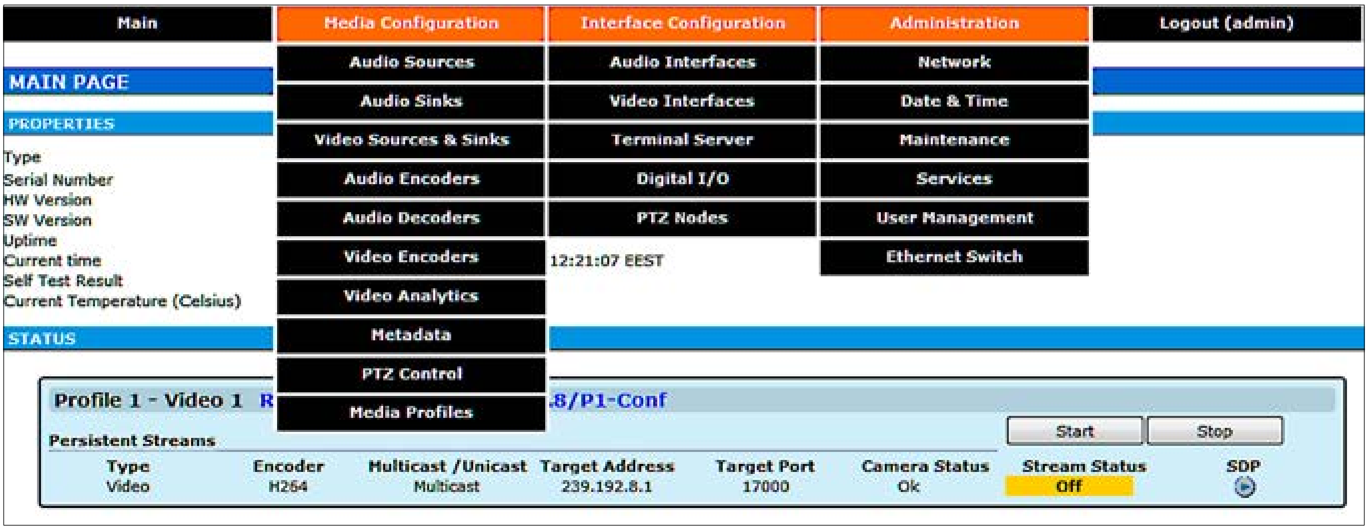
The **MPH** series video encoders can be fully configured using Web user interface (WebUI). You can access the Web user interface via your web browser, eg. Mozilla Firefox (recommended), Internet Explorer, Apple Safari and Google Chrome. The Secure HTTP (HTTPS, SSL 3.0 or TLS 1.0) feature is supported in MPH encoders.

System requirements for WebUI

- Network connection
- Ethernet cable
- Browser installed (Mozilla Firefox recommended)

Operation

Web user interface consists of several menus and pages. Only one page can be loaded at the same time. You can open a page by clicking the related menu (see picture below).
The Web user interface has the following menu structure:



12:21:07 EEST

Profile 1 - Video 1 R .8/P1-Conf

Persistent Streams

Type	Encoder	Multicast /Unicast	Target Address	Target Port	Camera Status	Stream Status	SDP
Video	H264	Multicast	239.192.8.1	17000	Ok	Off	▶

The information on configuration pages is shown in data fields or boxes. The settings can be changed in the data fields and boxes having white background. The unavailable or read-only options are grayed out. Place the cursor in the desired data field or box and enter a new setting. Settings are entered by ticking a checkbox or clicking on a radio button, by selecting from a pull-down list or by scrolling digits with the help of spin buttons.

Press keyboard's F5 button to refresh the WebUI page view.

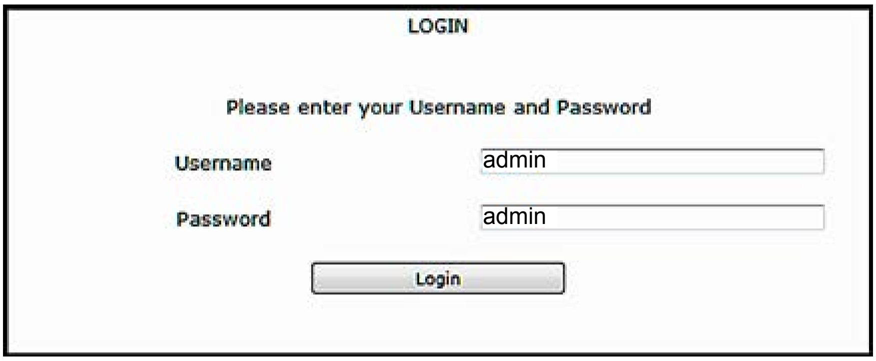
When changing the settings, always click Save button to confirm settings.

By clicking this button on a page you can see more settings.

Starting WebUI session

To create a WebUI session, first enter the device IP address into the web browser's address bar (see section Device's IP address). The following LOGIN window appears on the screen. Enter the required username and password (see bottom) in the fields and then click Login to continue --> Web user interface's MAIN PAGE appears on the screen.

The Web user interface session to **MPH** series video encoder is now activated.



LOGIN

Please enter your Username and Password

Username: admin

Password: admin

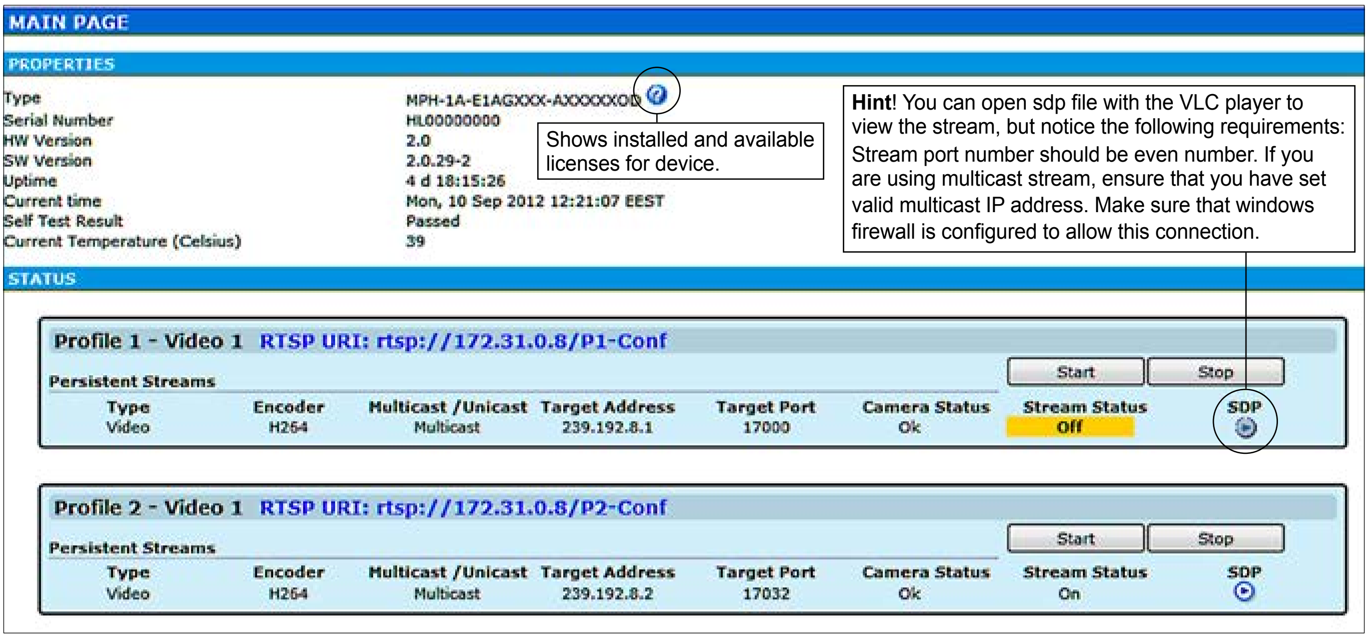
Login

Login window with the default username and password (for administrator).

User levels and permissions

The user management supports three different user levels of which each has specific priviledges as shown below. The individual usernames, passwords and approved user level can be changed via the WebUI and CLI.

Page	Operation	User	Operator	Administrator
Main	General Access	x	x	Read and write access to all pages and all settings
	SDP download	x	x	
	Log download	x	x	
	Start/Stop	x	x	
	RTSP link copy	x	x	
Video & Audio Encoder	General Access	-	x	
	Save	-	x	
	Cancel	-	x	
Maintenance	General Access	-	x	
	Backup	-	x	
	Restore	-	x	
	Reboot device	-	x	
	Soft factory reset	-	x	
	Hard factory reset	-	-	
	Software upload	-	-	
	Software download	-	-	
	License install	-	-	
User Management	General Access	x	x	
	Save	x	x	
	Cancel	x	x	
	Change password	x	x	
	Change user group	-	-	
	View/Edit other users	-	-	
	Add User	-	-	
Ethernet switch	Configuration	-	-	



MAIN PAGE

PROPERTIES

Type	MPH-1A-E1AGXXX-AXXXXXOD
Serial Number	HL00000000
HW Version	2.0
SW Version	2.0.29-2
Uptime	4 d 18:15:26
Current time	Mon, 10 Sep 2012 12:21:07 EEST
Self Test Result	Passed
Current Temperature (Celsius)	39

Shows installed and available licenses for device.

Hint! You can open sdp file with the VLC player to view the stream, but notice the following requirements: Stream port number should be even number. If you are using multicast stream, ensure that you have set valid multicast IP address. Make sure that windows firewall is configured to allow this connection.

STATUS

Profile 1 - Video 1 RTSP URI: rtsp://172.31.0.8/P1-Conf

Persistent Streams

Type	Encoder	Multicast /Unicast	Target Address	Target Port	Camera Status	Stream Status	SDP
Video	H264	Multicast	239.192.8.1	17000	Ok	Off	⊙

Profile 2 - Video 1 RTSP URI: rtsp://172.31.0.8/P2-Conf

Persistent Streams

Type	Encoder	Multicast /Unicast	Target Address	Target Port	Camera Status	Stream Status	SDP
Video	H264	Multicast	239.192.8.2	17032	Ok	On	⊙

MAIN PAGE

The MAIN PAGE is opened after the WebUI session has been established to the **MPH200** series video encoder.

MPH200 encoder contains maximum six (6) encoding profiles, which can be individually configured. On this page you can see each profile's current status and start/stop their video streaming.

Type: Device type (configuration map code)
Serial Number: Device serial number
HW Version: Device hardware version
SW Version: Device firmware version
Uptime: Device uptime
Current time: Device current time
Self Test Result: Device test result
Current Temperature: Current ambient temperature

STATUS

Here you can see each profile's current status.

Type: Stream type (Video)
Encoder: Encoding format (H.264/MJPEG/MPEG-4,MPEG-2)
Multicast /Unicast: Video transmission mode (multicast/unicast)
Target Address: Multicast: Multicast IP address / multicast group
Unicast: IP address of receiving decoder
Target Port: UDP port number
Camera Status: Camera status (Ok/No signal)
Stream Status: Video stream status (On/Off)
SDP: Link to SDP file (Session Description Protocol). The SDP file contains stream parameters that are meant for 3rd party applications (e.g. SW decoders) to open/view the stream. SDP-link requires that video streaming is active.

Download short term logs: Debug log file
Download long term logs: Debug log file

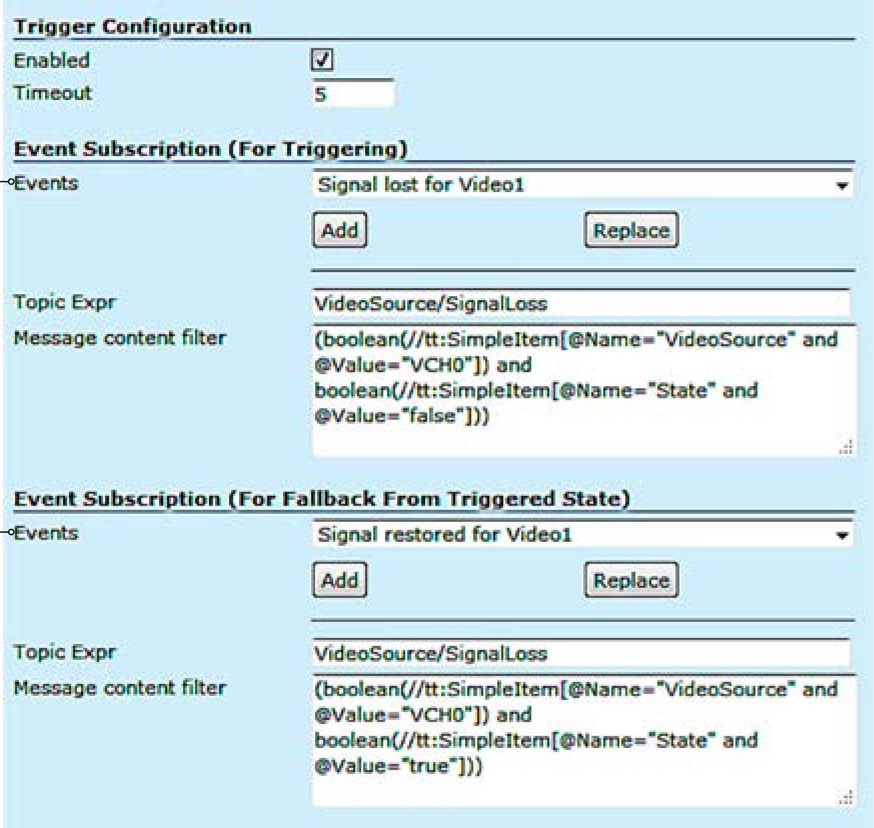
Event management system

MPH event management system

MPH encoders internally controls events as specified by ONVIF. Events are generated from Digital IO inputs, motion detection, tampering detection and video signal loss and each of those generate event with different Topic. In addition to event topics, events contain data describing the event such as the video interface related, amount of motion and threshold, etc.

The event data is available in the “Message Content filter” box, which is XPath format for matching XML content. Triggering occurs when defined “Topic expression” and “message content filter” matches the internal event.

MPH encoder can trigger actions for **video**, **audio** (only MPH200 series) and **contact closers** (Digital I/O) output. These events are also available for video management system to trigger configurable alarms. You can add multiple event at the same time and each one triggers action.



Trigger Configuration

Enabled ☑

Timeout 5

Event Subscription (For Triggering)

Events: Signal lost for Video1

Topic Expr: VideoSource/SignalLoss

Message content filter: (boolean(//tt:SimpleItem[@Name="VideoSource" and @Value="VCH0"]) and boolean(//tt:SimpleItem[@Name="State" and @Value="false"]))

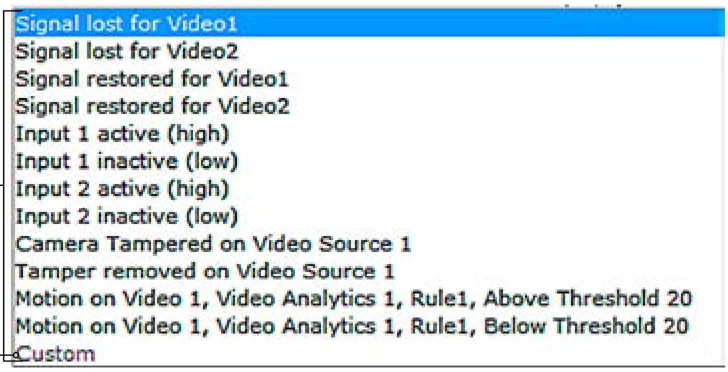
Event Subscription (For Fallback From Triggered State)

Events: Signal restored for Video1

Topic Expr: VideoSource/SignalLoss

Message content filter: (boolean(//tt:SimpleItem[@Name="VideoSource" and @Value="VCH0"]) and boolean(//tt:SimpleItem[@Name="State" and @Value="true"]))

Available events for triggering. First choose the required event from the list and then click Add button to select the event -> The event data appears on the Message content filter box.



Signal lost for Video1
Signal lost for Video2
Signal restored for Video1
Signal restored for Video2
Input 1 active (high)
Input 1 inactive (low)
Input 2 active (high)
Input 2 inactive (low)
Camera Tampered on Video Source 1
Tamper removed on Video Source 1
Motion on Video 1, Video Analytics 1, Rule1, Above Threshold 20
Motion on Video 1, Video Analytics 1, Rule1, Below Threshold 20
Custom

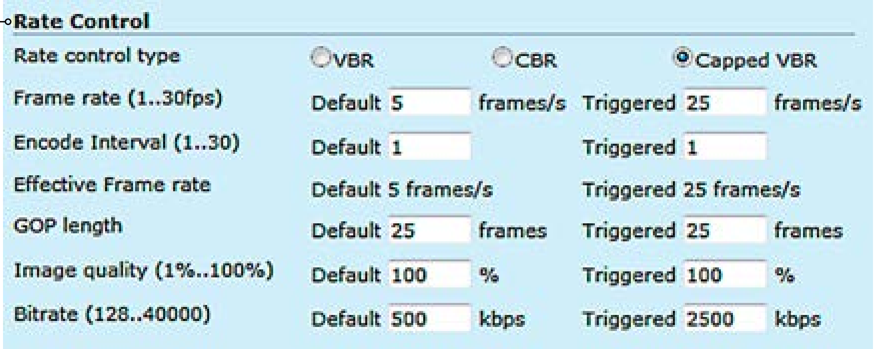
The list of available events for triggering.

Custom = Modified event for triggering.

Event management for video

For video it can trigger actions such as changing video settings, frame rate, bit rate and video quality for each video profile based on events.

An example when the video bit rate and frame rate change when an event triggered.



Rate Control

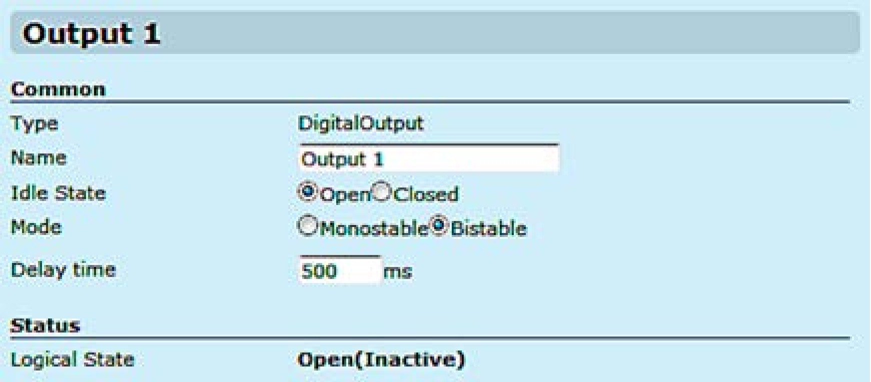
Rate control type	○VBR	○CBR	●Capped VBR		
Frame rate (1..30fps)	Default 5	frames/s	Triggered 25	frames/s	
Encode Interval (1..30)	Default 1		Triggered 1		
Effective Frame rate	Default 5 frames/s		Triggered 25 frames/s		
GOP length	Default 25	frames	Triggered 25	frames	
Image quality (1%..100%)	Default 100	%	Triggered 100	%	
Bitrate (128..40000)	Default 500	kbps	Triggered 2500	kbps	

Event subscription (for triggering)	Event subscription (for fallback from triggered state)
Signal lost for video 1 and 2	Signal restored for video 1 and 2
Camera tempered for video source 1 and 2	Temper removed for video source 1 and 2
Motion detection above the threshold for video 1 and 2	Motion Detection below the threshold for video 1 and 2

Available events for video.

Event management for contact closure (digital I/O)

For contact closure it can trigger actions such as changing output state in case of an event.



Output 1

Common

Type	DigitalOutput
Name	Output 1
Idle State	●Open○Closed
Mode	○Monostable●Bistable
Delay time	500 ms

Status

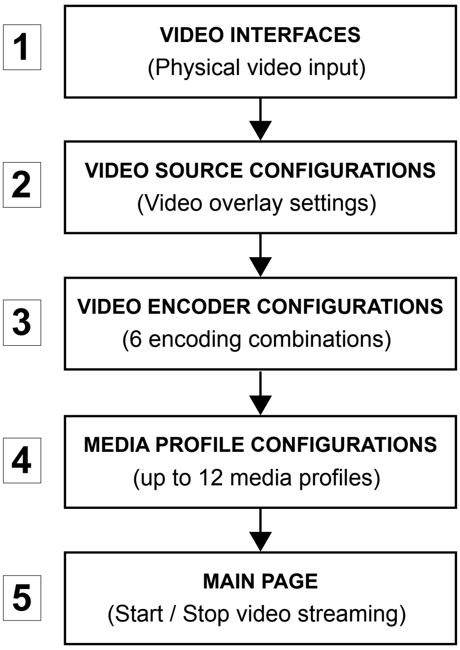
Logical State	**Open(Inactive)**

Event subscription (for triggering)	Event subscription (for fallback from triggered state)
I/O Inputs activation	I/O Inputs deactivation

Available events for contact closure.

Configuring video channels

__Note!__ MPH encoder has automatic NTSC/PAL video format detection. When changing the video format, the device must reboot.



1 **VIDEO INTERFACES** (Physical video input)

2 **VIDEO SOURCE CONFIGURATIONS** (Video overlay settings)

3 **VIDEO ENCODER CONFIGURATIONS** (6 encoding combinations)

4 **MEDIA PROFILE CONFIGURATIONS** (up to 12 media profiles)

5 **MAIN PAGE** (Start / Stop video streaming)

Step-by-step flowchart how to configure video channel in the MPH encoder.

Video connection

MPH encoder is available in one and two video input models. One channel model has support for CVBS or HD-SDI video signal, two channel model has support only for CVBS video signal. One channel (CVBS input) model has equipped with additional loop-though output connector. The video connector type is a BNC female. The video input impedance is 75 Ω. The nominal input level is 1 Vpp. Video inputs are equipped with dual colour VIDEO indicator led's on the front panel. Video port settings can be configured from web user interface (WebUI).

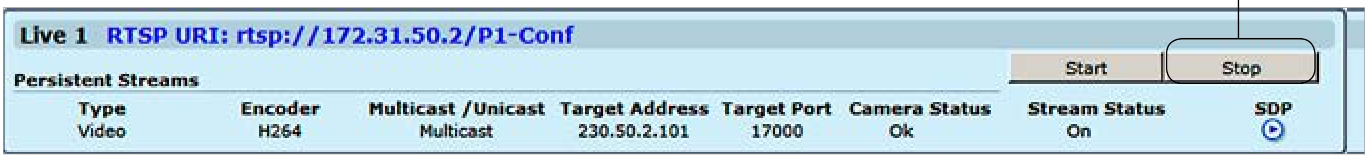
Led	Colour	Video mode
Video 1	Green	Video connector is used as video input and is locked to valid video signal
	(Short) Blinking Green	The video input is not used in any active media profile, but is locked to video
	Orange	Video connector is used as video input, but no valid video signal is detected
	Off / Dark	Power is OFF or device is restarting.

Led	Colour	Video mode
Video 2	Green	Video connector is used as video input and is locked to valid video signal
	(Short) Blinking Green	The video input is not used in any active media profile, but is locked to video
	Orange	Video connector is used as video input, but no valid video signal is detected
	Off / Dark	Power is OFF or device is restarting, or configured for loop-through output (1-ch version only)

Video channel configuration

MPH is an ONVIF compliant encoder and video channel configuration is designed according to ONVIF standard.

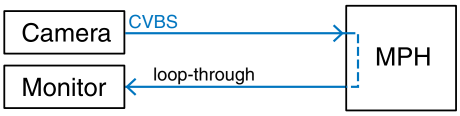
__Note!__ Before modifying the configuration of a video profile, make sure that video stream is stopped on the MAIN page (changing only encoding parameters don't require stopping of the stream).



Live 1 RTSP URI: rtsp://172.31.50.2/P1-Conf

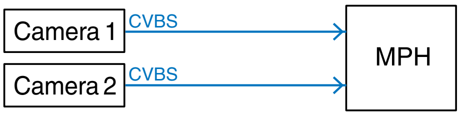
Persistent Streams

Type	Encoder	Multicast /Unicast	Target Address	Target Port	Camera Status	Stream Status	SDP
Video	H264	Multicast	230.50.2.101	17000	Ok	On	⊙

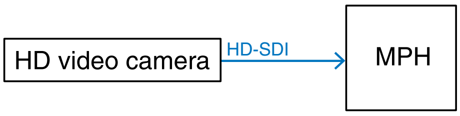


MPH241 contains one video input (with loop-through).

Note! *One channel MPH encoder's second video connector is loop-through port for an analog monitor. It is designed to transmit the same analog video signal out that is received from video input.*



MPH242 contains two video inputs.



MPH241 encoder supports **HD-SDI** digital video format up to 1080p resolution (when license MLH213 enabled) .

Video streaming methods

Video input is the physical video connector (BCN female) available for video signal. Naturally each video input can be connected to a camera or any other standard video source. The default video input mode is set to PAL/NTSC format (CVBS). MPH241 model has also support fot HD-SDI.

High-definition serial digital interface (HD-SDI)

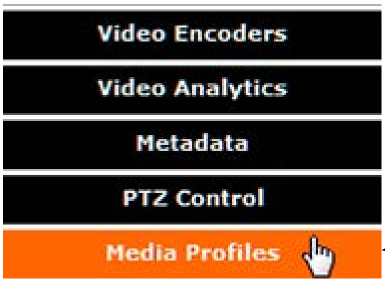
MPH241 encoder supports **HD-SDI** digital video interface. HD-SDI interface is defined by SMPTE 292M standard and allows bitrates up to 1.485 Gbit/s. Progressive input signals are recommended to provide the best picture quality. The HD-SDI support can be enabled with **MLH213** license. When changing the video format from CVBS to HD-SDI, the device must reboot. The loop-through port is not available in HD-SDI mode.

Input Signal	Output frame/ field rates	Resolutions	Coding	Notes
720p25	1...25fps	1280x720, QCIF, CIF, 4CIF	Progressive	Input signal is progressive, thus deinterlace is not needed neither at encoder or decoder side
720p30	1...30fps			
720p50				
720p60				
1080i50	1...25fps	1920x1080), QCIF, CIF, 4CIF	Field coded	Input signal 1080i is interlaced format containing 60 fields/s. Transmitted video stream is interlaced (field-coded), thus deinterlacing at decoder side is required when display is progressive
1080i60	1...30fps			
1080p25	1...25fps	1920x1080), QCIF, CIF, 4CIF	Progressive	Input signal is progressive, thus deinterlace is not needed neither at encoder or decoder side
1080p30	1...30fps			

Supported **HD** signal formats and encoding formats.

Media profile (video)

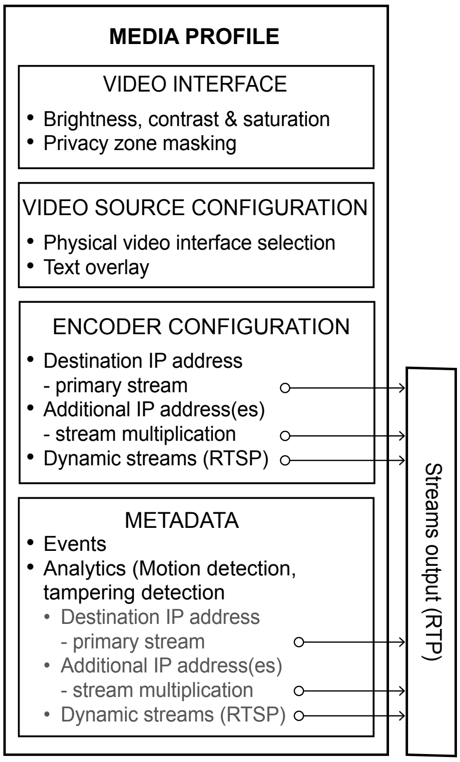
MPH series encoders has a total of six (6) media profiles. Each media profile can be set separately for individual resolution, frame rate, GOP structure and bitrate, within the processing power of the device.



Click "**Media Profiles**" under the Media Configuration menu. **Media Profile Configurations** page appears on the screen. On this page you can associate virtual video sources with physical video inputs and encoding profiles.

By default this page contains six different media profiles.

> ***Notes***! *It is not possible to change encoding format /resolution and video input settings on this page. Before modifying the profiles the video stream must be stopped on the MAIN page.*


MEDIA PROFILE

VIDEO INTERFACE
- Brightness, contrast & saturation
- Privacy zone masking

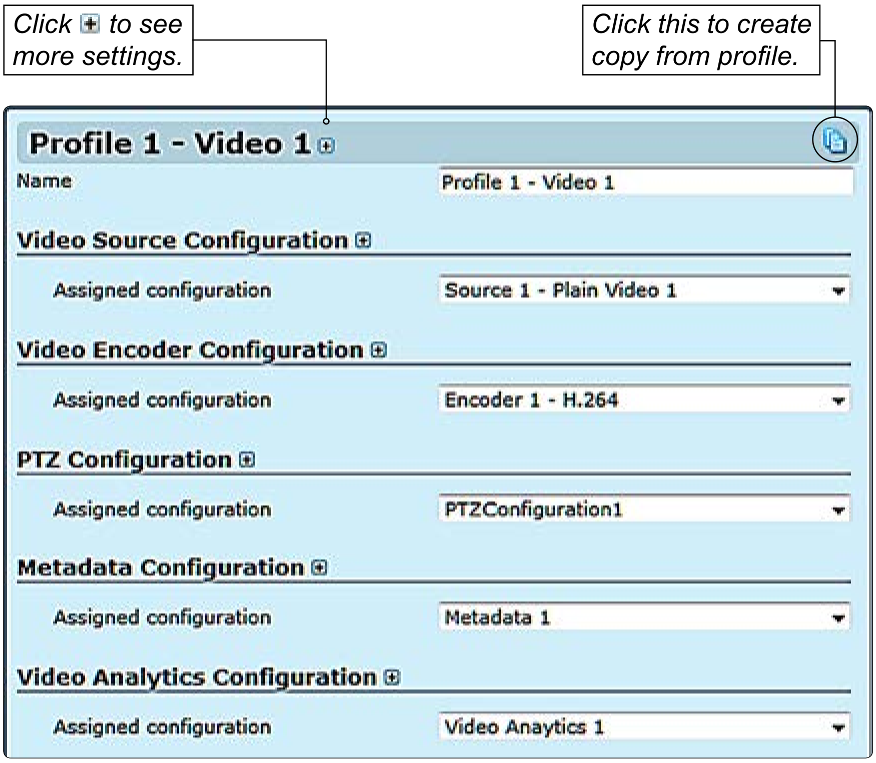
VIDEO SOURCE CONFIGURATION
- Physical video interface selection
- Text overlay

ENCODER CONFIGURATION
- Destination IP address
  - primary stream
- Additional IP address(es)
  - stream multiplication
- Dynamic streams (RTSP)

METADATA
- Events
- Analytics (Motion detection, tampering detection
  - Destination IP address
    - primary stream
  - Additional IP address(es)
    - stream multiplication
  - Dynamic streams (RTSP)

Streams output (RTP)

Description how the video encoder, a video source and video input is assembled to the media profile.


Click ⊞ to see more settings.

Click this to create copy from profile.

Profile 1 - Video 1 ⊞

Name: Profile 1 - Video 1

Video Source Configuration ⊞

Assigned configuration: Source 1 - Plain Video 1

Video Encoder Configuration ⊞

Assigned configuration: Encoder 1 - H.264

PTZ Configuration ⊞

Assigned configuration: PTZConfiguration1

Metadata Configuration ⊞

Assigned configuration: Metadata 1

Video Analytics Configuration ⊞

Assigned configuration: Video Anaytics 1

MEDIA PROFILE CONFIGURATIONS page.

Name: User defined alias name for media profile (max 63 chars).

Video Source Configuration

Assigned configuration: Select assigned video source configuration.

Video Encoder Configuration

Assigned configuration: Select assigned video encoder configuration.

PTZ Configuration

Assigned configuration: Select assigned PTZ configuration.

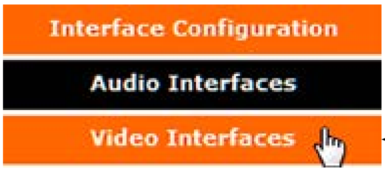
Metadata Configuration

Assigned configuration: Select assigned metadata configuration.

Video Analytics Configuration

Assigned configuration: Select assigned video analytics configuration.

Video interfaces



Click “**Video Interfaces**” under the Interface Configuration menu. **Video Interfaces** page appears on the screen. In this page you can see the number of physical video inputs available and adjust the brightness, contrast and saturation values for them.

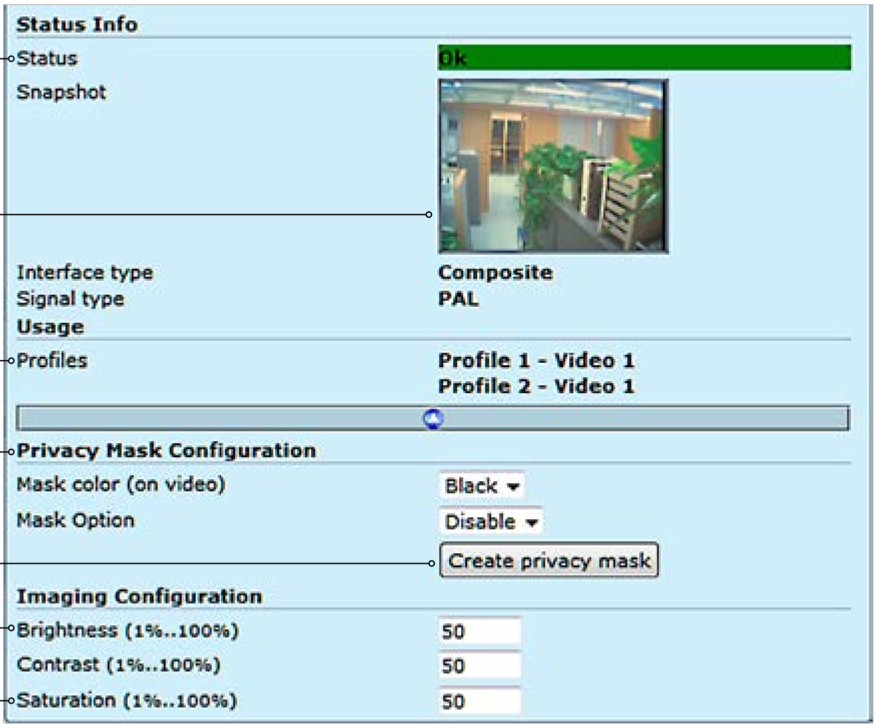
Video status. The colour bar reflect the status of the video. Green colour bar means that there is video signal. Yellow colour bar with text tells that there is no video.

Screenshot from the current video.

Indicates what media profile is using this video interface.

When monitoring an area for security, there may be certain parts within the camera’s field of view that need to be kept private. Masking is a feature that enables these areas to be concealed from view.

Brightness, Contrast and Saturation values for the video channel.



Status Info

Status	Ok
Snapshot	
Interface type	**Composite**
Signal type	**PAL**

Usage

Profiles	**Profile 1 - Video 1** **Profile 2 - Video 1**

Privacy Mask Configuration

Mask color (on video)	Black ▾
Mask Option	Disable ▾
	Create privacy mask

Imaging Configuration

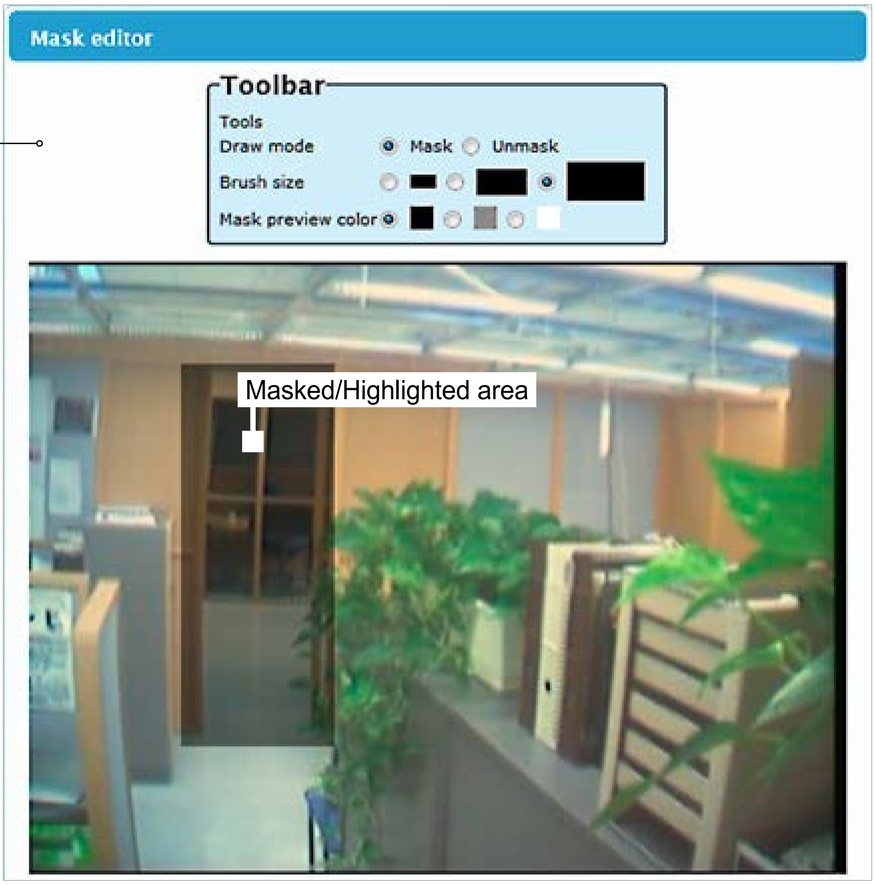
Brightness (1%..100%)	50
Contrast (1%..100%)	50
Saturation (1%..100%)	50

VIDEO INTERFACES page.

User can configure the encoder to automatically hide certain areas with a mask, which can be adjusted in terms of its colour.

Mask editor shows a screenshot from camera view and overlays a translucent mask on the image.

Draw mode: Masked (highlighted) areas are private areas that are removed (concealed) from camera’s view.
Brush size: Select brush size for masking.
Mask color: Depending on the brightness of the image snapshot, appropriate mask preview color can be chosen. This color affects the preview on mask editor only and doesn’t reflect on the streaming video.



Mask editor

Toolbar

Tools

Draw mode	● Mask ○ Unmask
Brush size	○ ▬ ○ ■ ● ■
Mask preview color	● ■ ○ ■ ○ □

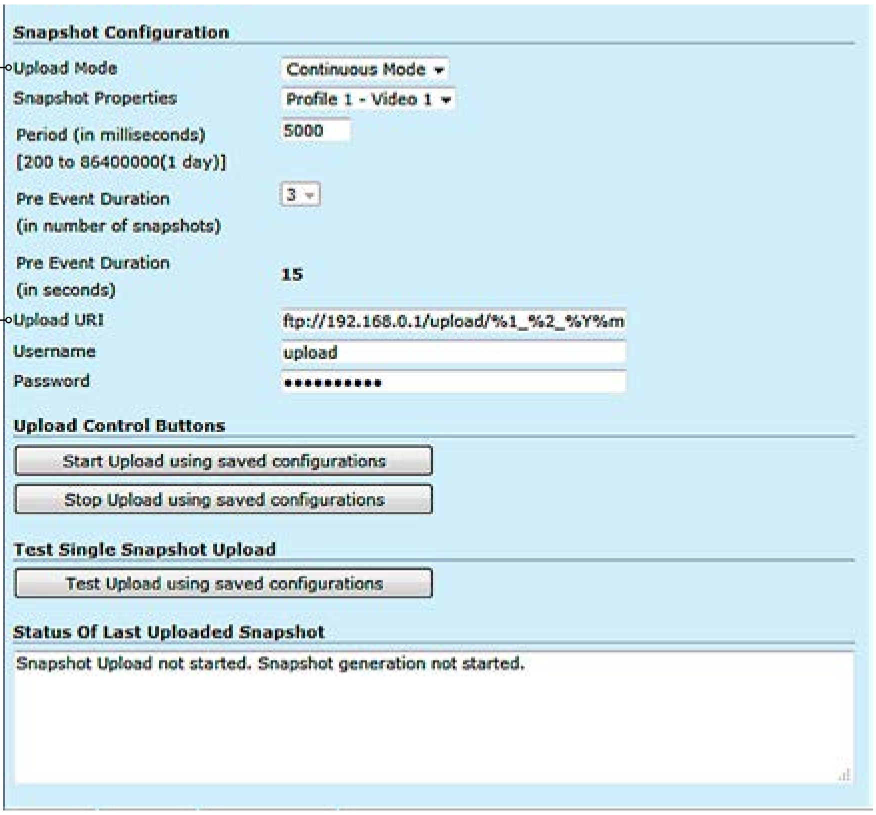
MASK EDITOR page contains settings for hiding certain areas from the encoded picture.

JPEG snapshot configuration

Additionally there is a JPEG image capture feature that allows taking JPEG snapshots from the video and storing them into a ftp server. It is also possible view JPEG captures with http.

Continuous: Device generates a snapsthot at specified interval (period) and sends the images to configured FTP server.
Triggered: Snapshots are generated when internal event triggers it. Triggering event can be motion detection, tampering or digital IO event.

%d: The day of the month as a decimal number (range 01...31).
%H: The hour as a decimal number using a 24-hour clock (range 00...23).
%I: The hour as a decimal number using a 12-hour clock (range 01...12).
%m: The month as a decimal number (range 01...12).
%M: The minute as a decimal number (range 00...59).
%S: The second as a decimal number (range 00...60).
%4: The milliseconds as a decimal number (range 0000...9999).
%p: Either “AM” or “PM” according to the given time value, or the corresponding strings for the current locale. Noon is treated as “PM” and midnight as “AM”.
%y: The year as a decimal number without a century (range 00...99).
%Y: The year as a decimal number including the century.
%1: Device hostname (manually conf. or received from DHCP-server).



Snapshot Configuration

Upload Mode: Continuous Mode
Snapshot Properties: Profile 1 - Video 1
Period (in milliseconds) [200 to 86400000(1 day)]: 5000
Pre Event Duration (in number of snapshots): 3
Pre Event Duration (in seconds): 15
Upload URI: ftp://192.168.0.1/upload/%1_%2_%Y%m
Username: upload
Password: ••••••••••

Upload Control Buttons

Start Upload using saved configurations
Stop Upload using saved configurations

Test Single Snapshot Upload

Test Upload using saved configurations

Status Of Last Uploaded Snapshot

Snapshot Upload not started. Snapshot generation not started.

Snapshot Configuration:

Upload Mode: Snapshot generation can operate in two separate modes: Continous and triggered mode.

Snapshot Properties: Keeps the event state unchanged for the defined period for instance if an

Period (in milliseconds): Specified interval when device generates a snapsthot.

Pre Event Duration: After event has occured, device sends first configured number of images before the event and then continues sending images until defined timeout [ms] elapses.

Upload URI: Defines the remote FTP server address. URI can contain arbitrary directory path and device shall create the directory if it does not yet exist.

Username: Set username for server.

Password: Set password for server.
***Note**! Hard Factory reset restores admin password to defaults.*

Upload Control Buttons:

Start Upload using saved configurations: Starts uploading using saved configurations.
Stop Upload using saved configurations: Stops uploading using saved configurations.

Test single Snapshot Upload:

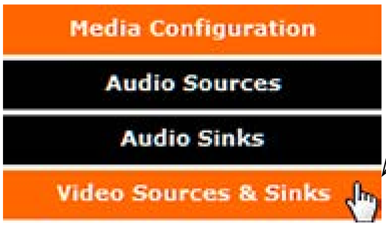
Test Upload using saved configurations: Tests upload using saved configurations.

Status of last Uploaded Snapshot:

Shows status of last uploaded snapshots.

Snapshot URI example:
ftp://192.168.0.247/upload/%1_%Y%m%d/camera1_%H%M%S_%4.jpg expands to:
ftp://192.168.0.247/upload/MPH102-RD00101126_20140424/camera1_183059”)_830.jpg

Trigger Configuration
See section “Event management system” from page 31 for more details.

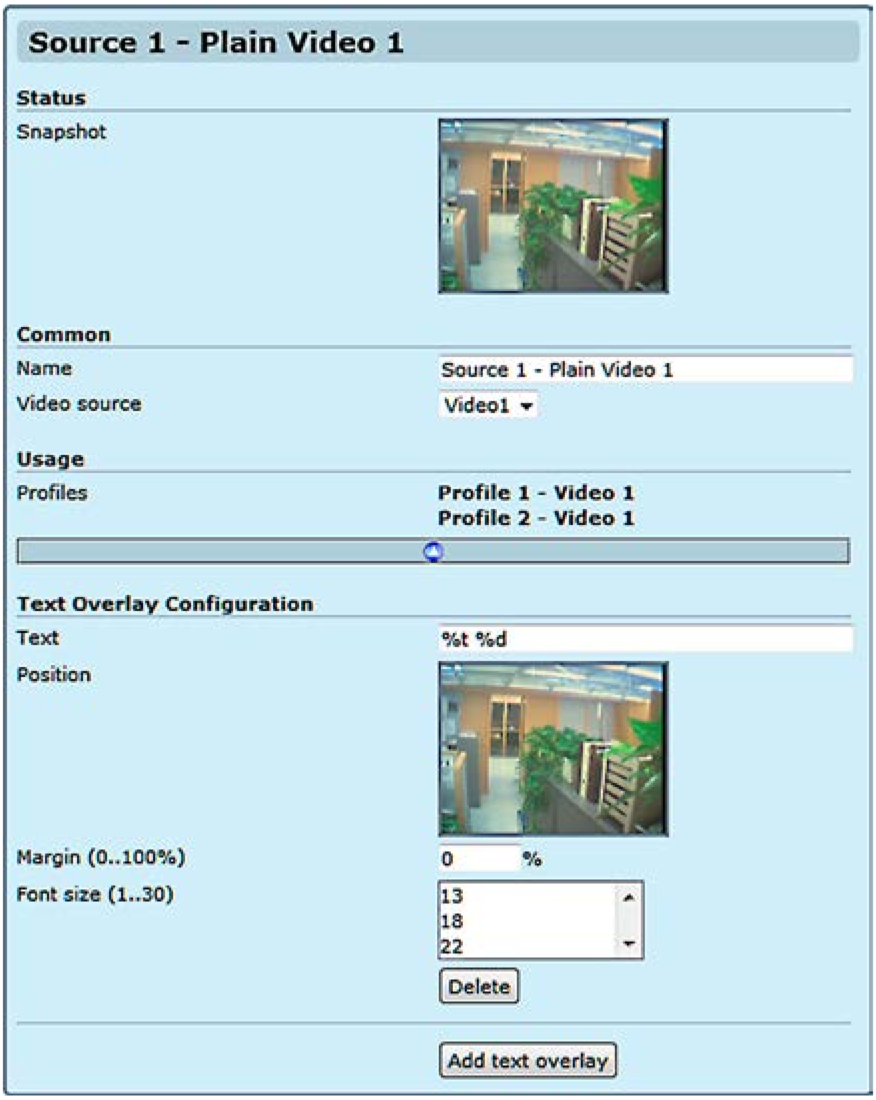


Video source and sinks

Click “**Video Source and Sinks**” under the Media Configuration menu. **Video Source Configurations** page appears on the screen. Video overlay settings can be changed on this page, you can enter a text and time/date on the video.

Note! *Date and time settings can be changed from Date & Time page.*

There are four different virtual video sources available for video inputs. This feature allows you to set four different views with/without video overlay content.



Source 1 - Plain Video 1

Status

Snapshot

Common

Name: Source 1 - Plain Video 1

Video source: Video1

Usage

Profiles: Profile 1 - Video 1
Profile 2 - Video 1

Text Overlay Configuration

Text: %t %d

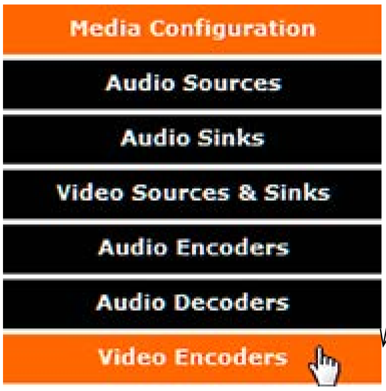
Position

Margin (0..100%): 0 %

Font size (1..30): 13, 18, 22

VIDEO SOURCE CONFIGURATIONS page.

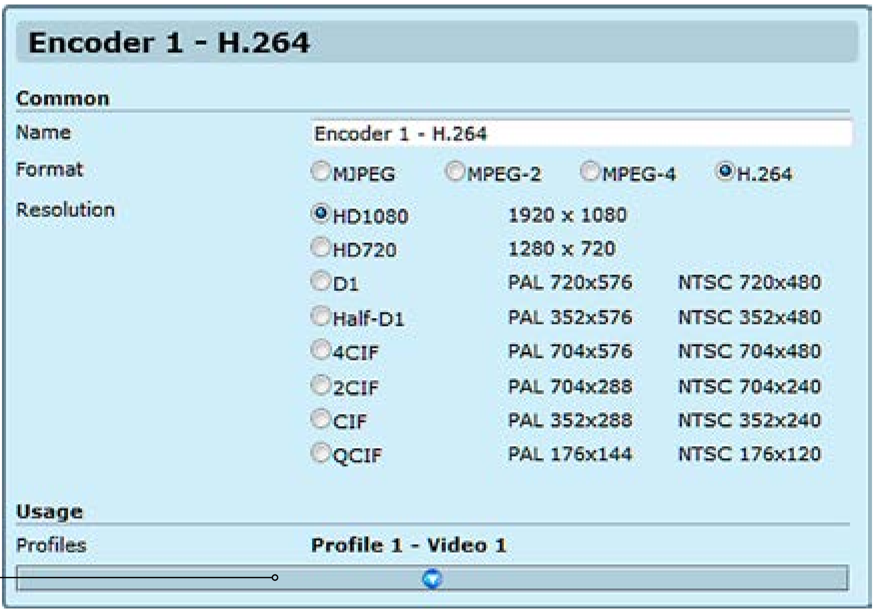
Video encoders



Click “**Video Encoders**” under the Media Configuration menu. **Video Encoder Configurations** page appears on the screen. Video encoding settings can be configured on this page, e.g. select format (MJPEG, MPEG-2, MPEG-4 and H.264), set resolution, bit rate, frame rate and multicast IP/port settings for each profile.

This page contains (by default) six different customizable encoding profiles. This feature allows you to set six different video encoding combinations, each with their own settings.

On this page you can also add multiplied multicast/unicast streams from each encoder.



Encoder 1 - H.264

Common

Name: Encoder 1 - H.264

Format: ○ MJPEG ○ MPEG-2 ○ MPEG-4 ● H.264

Resolution:

● HD1080	1920 x 1080	
○ HD720	1280 x 720	
○ D1	PAL 720x576	NTSC 720x480
○ Half-D1	PAL 352x576	NTSC 352x480
○ 4CIF	PAL 704x576	NTSC 704x480
○ 2CIF	PAL 704x288	NTSC 704x240
○ CIF	PAL 352x288	NTSC 352x240
○ QCIF	PAL 176x144	NTSC 176x120

Usage

Profiles: **Profile 1 - Video 1**

Click this to see more settings.

VIDEO ENCODER CONFIGURATIONS page.

Common

Name: User defined alias name for video profile (max 63 chars).

Resolution: Video resolution, either digital HD1080 or HD720, or analog D1, Half-D1, 4CIF, 2CIF, CIF or QCIF.

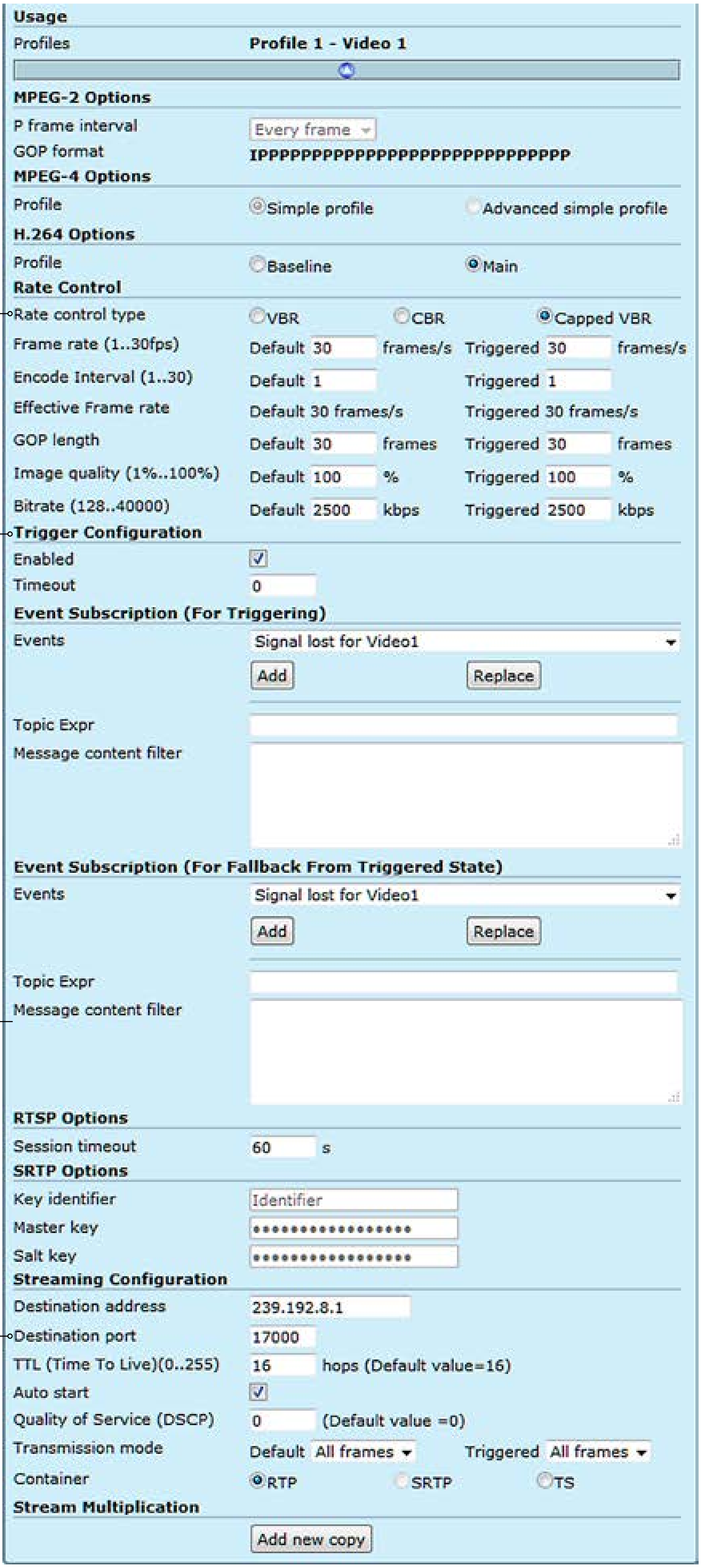
***VBR** (Variable Bit Rate) video aims at constant quality, but as the bit rate fluctuates over time.*

***CBR** (Constant Bit Rate) video fluctuates in quality, while its multiplexing behaviour is easy to predict.*

*Because in unconstrained VBR video the bit rate fluctuation might be too large, **capped VBR** video is proposed as an alternative. Capped VBR video aims at a constant quality, but when in certain intervals this requires a too high bit rate, the bit rate is limited (i.e.,capped) in order to support more video flows on the links, at the expense of a quality reduction.*

Trigger Configuration
See section "Event management system" from page 60 for more details.

***Note!** Only even port numbers can be used for RTP, and then the following odd port number shall be used for RTCP (RFC 1889).*



Usage			
Profiles	**Profile 1 - Video 1**		
MPEG-2 Options			
P frame interval	Every frame ▾		
GOP format	IPPPPPPPPPPPPPPPPPPPPPPPPPPPPP		
MPEG-4 Options			
Profile	● Simple profile	○ Advanced simple profile	
H.264 Options			
Profile	○ Baseline	● Main	
Rate Control			
Rate control type	○ VBR	○ CBR	● Capped VBR
Frame rate (1..30fps)	Default 30 frames/s	Triggered 30 frames/s	
Encode Interval (1..30)	Default 1	Triggered 1	
Effective Frame rate	Default 30 frames/s	Triggered 30 frames/s	
GOP length	Default 30 frames	Triggered 30 frames	
Image quality (1%..100%)	Default 100 %	Triggered 100 %	
Bitrate (128..40000)	Default 2500 kbps	Triggered 2500 kbps	
Trigger Configuration			
Enabled	☑		
Timeout	0		
Event Subscription (For Triggering)			
Events	Signal lost for Video1 ▾		
	Add	Replace	
Topic Expr			
Message content filter			
Event Subscription (For Fallback From Triggered State)			
Events	Signal lost for Video1 ▾		
	Add	Replace	
Topic Expr			
Message content filter			
RTSP Options			
Session timeout	60 s		
SRTP Options			
Key identifier	Identifier		
Master key	•••••••••••••••••		
Salt key	•••••••••••••••••		
Streaming Configuration			
Destination address	239.192.8.1		
Destination port	17000		
TTL (Time To Live)(0..255)	16 hops (Default value=16)		
Auto start	☑		
Quality of Service (DSCP)	0 (Default value =0)		
Transmission mode	Default All frames ▾	Triggered All frames ▾	
Container	● RTP	○ SRTP	○ TS
Stream Multiplication			
	Add new copy		

VIDEO ENCODER CONFIGURATIONS page.

Usage

Profiles: Here you see how the media profile is assigned to a video source.

MPEG-2 Options:

P frame interval: There are three options; Every frame = IP, Every second frame = IBP, Every third frame = IBBP.

GOP format: MPEG-2 GOP format.

MPEG-4 Options:

Simple profile: Simple Profile (SP) is recommended only for decoder compatibility. Interlacing toolsets are not used.

Advanced simple profile: Advanced Simple Profile (ASP) Level 5 enables Macroblock-Adaptive Frame/Field Coding (MBAFF) which offers better image quality and better compression ratio with interlaced video signal. Recommended choice when interlaced stream is selected (D1 and Half-D1 resolutions).

H.264 options:

Baseline: Baseline Profile (BP) Level 3 is recommended only for decoder compatibility. Interlacing toolsets are not used.

Main: Main Profile (MP) Level supports field encoding which which offers better image quality and better compression ratio with interlaced video signal. Recommended choice when interlaced stream is selected (D1 and Half-D1 resolutions).

Rate control:

Rate control type: Defines video bitrate mode. There are three options available, variable bitrate (VBR), constant bitrate (CBR) or capped VBR. Rate control is a trade off between quality fluctuations and bit rate variability.

Frame rate (1...30fps): Defines video frame rate (adjustable 1...30fps for PAL/NTSC).

Encode Interval (1...30): Defines encoding frame interval; for instance when encoding interval is 1, all frames are encoded, value 2 means, every second frame is encoded.

GOP length: Specifies the order in which intra- and inter-frames are arranged. The GOP is a group of successive pictures within an encoded video stream. Each coded video stream consists of successive GOPs. From the pictures contained in it, the visible frames are generated. For instance if you 25 FPS video stream, GOP= 25 means one I-frame per full frame.
GOP = 13 means two I-frames per full frame. GOP = 5 means 5 I-frames, 20 p-frames per second

Image quality (1%...100%): Encoded video image quality, can adjust in VBR or capped VBR mode.

Bitrate (128...20000): Encoded video bitrate, 128Kbps...15Mbps.

Trigger configuration:

Enabled: Enables or disables the trigger feature.

Timeout: Keeps the event state unchanged for the defined period for instance if an event clears quickly, it does not change its state for the defined timeout, recommended 5 seconds.

Event subscription (for triggering):

Events: Select the event type.

Topic Expr: The topic expression of the event.

Message content filter: Event description, filter and values.

RTSP options:

Session timeout: Timeout for RTSP session

Streaming Configuration:

Destination address: Destination IP address. **Multicast**: Multicast IP address / multicast group. This multicast IP address has to be same at both encoder and corresponding decoders. **Unicast**: IP address of receiving decoder.

Destination port: UDP port number (0...65536). This number has to be same at both encoder and decoder pairs. Use even port numbers only.

TTL (Time To Live): Time-To-Live for video packets = number of hops that a packet is permitted to travel before being discarded by a router (0...255).

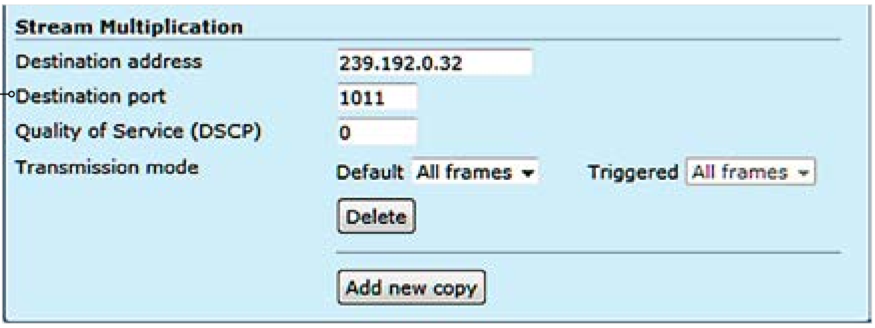
Auto start: Video streaming will automatically start after reboot. Changing autostart does not immediately start or stop streams.

Quality of Service (DSCP)(0...63): (Differentiated Services Code Point) field lets you set bits in the stream IP header allowing a network device to apply rules such as how the packet is forwarded in the network and QoS (Quality of service) management.

Transmission mode: **All frames** is the default option and enables the encoder to pass (stream) all frames (I and P frames). **I frames** enables encoder to send only I-frames, meaning filtering all P frames. **Paused** = pause streaming.

Container: RTP (Real-time Transport Protocol), SRTP (Secure Real-time Transport Protocol) or TS (MPEG transport stream).

Note! Only even port numbers can be used for RTP, and then the following odd port number shall be used for RTCP (RFC 1889).



Stream Multiplication

Destination address: 239.192.0.32

Destination port: 1011

Quality of Service (DSCP): 0

Transmission mode: Default All frames ▾ Triggered All frames ▾

Video stream multiplication

Each video encoding profile can be assigned with five (5) different destination addresses (primary stream and additional streams). These addresses can be freely set to unicast, multicast or a combination of these. In addition there is a tick box that enables to filter out P-frames from each output stream for low frame rate applications. This approach provides for a very cost efficient dual streaming in situations where the low frame rate stream is a direct subset of the higher frame rate stream. In practise this means that the number of I-frames is the common nominator. As an example, one MPH241 unit can stream (unicast or multicast) 2 x D1@25fps for monitoring and 4 x 2CIF@3fps (unicast or multicast) for recording simultaneously. The precondition is, the number of I-frames per second in the primary stream should match to frame rate of the low frame rate stream. In the example above the I-frame interval of the primary stream would need to be 8 (GOP = IPPPPPPPIPPPPPPPIPP…) generating 3 I-frames per second thus resulting in 3fps stream when P-frames are filtered out. The use of multiple destination addresses up to a certain degree doesn't load the MPU; however one should take into account that the aggregate bit rate of all output streams does not exceed the capacity of the 100Mbps interface.

Stream multiplication:

Destination address: Destination IP address. **Multicast**: Multicast IP address / multicast group. This multicast IP address has to be same at both encoder and corresponding decoders. **Unicast**: IP address of receiving decoder.

Destination port: UDP port number (0...65536). This number has to be same at both encoder and decoder pairs. Use even port numbers only.

Quality of Service (DSCP/DiffServ): Differentiated Services Code Point field lets you set bits in the stream IP header allowing a network device to apply rules such as how the packet is forwarded in the network and QoS (Quality of service) management.

Transmission mode: **All frames** is the default option and enables the encoder to pass (stream) all frames (I and P frames). **I frames** enables encoder to send only I-frames, meaning filtering all P frames. **Paused** = pause streaming.

Add new copy: Adds new copy from stream.

Video streaming performance

The following performance table shows the performance of MPH200 devices in encoding and streaming video signal per video input simultaneously.

Total video sessions = original video stream + multiplied streams.

SRTP (Secure Real-time Transport Protocol) = encrypted RTP stream.

De-interlacing is done by choosing right profile.

Configurations for single input in two channel encoder (NTSC/PAL)												
MPEG-2/ MPEG-4/H.264 Encoder 1	MPEG-2/ MPEG-4/H.264 Encoder 2	MPEG-2/ MPEG-4/H.264 Encoder 3	MPEG-2/ MPEG-4/H.264 Encoder 4	De-interlace	Privacy zone masking	Motion detection	Tampering	Text overlay	Total sessions	SRTP sessions	Audio
D1 30fps 6Mbps	4CIF 30fps 6Mbps			30 fps	Yes			40 chars/ encoder	3	3	1xAAC stereo
D1 30fps 6Mbps	4CIF 15fps 6Mbps			15 fps	Yes	QCIF 5fps	Yes	40 chars/ encoder	3	3	1xAAC stereo
D1 30fps 6Mbps	2CIF 30fps 3Mbps				Yes	QCIF 5fps	Yes	40 chars/ encoder	3	3	1xAAC stereo
CIF 30fps 1.5Mbps	CIF 30fps 1.5Mbps	CIF 30fps 1.5Mbps	CIF 30fps 1.5Mbps		Yes	QCIF 5fps	Yes	40 chars/ encoder	4	4	1xAAC stereo
Configurations for single input in single channel encoder (NTSC/PAL)											
MPEG-2/ MPEG-4/H.264 Encoder 1	MPEG-2/ MPEG-4/H.264 Encoder 2	MPEG-2/ MPEG-4/H.264 Encoder 3	MPEG-2/ MPEG-4/H.264 Encoder 4	De-interlace	Privacy zone masking	Motion detection	Tampering	Text overlay	Total sessions	SRTP sessions	Audio
D1 30fps 6Mpbs	D1 30fps 6Mpbs	4CIF 30fps 6Mbps	4CIF 30fps 6Mbps	30fps	Yes	QCIF 5fps	Yes	40 chars/ encoder	8	4	1xAAC stereo
1080p 30fps 20Mbps					Yes	QCIF 5fps	Yes	40 chars/ encoder	2	1	1xAAC stereo
720p 30fps 10Mbps					Yes	QCIF 5fps	Yes	40 chars/ encoder	4	2	1xAAC stereo

Available video streaming performance for MPH200 series encoders.

> ***Note!*** *Video traffic could overload Fast Ethernet throughput depending on number of streams/bitrate combination. Be sure that the configuration does not exceed Fast Ethernet port throughput.*

***Note!** Minimum (Min) values may be smaller without any picture quality degradation.*

Recommended bitrates for **H.264** encoding.

Resolution	Bitrate (kbps)						
	Min*		Max	Recommended			
				Interlacing toolsets OFF		Interlacing toolsets ON	
	CBR	CapVBR		CBR	CapVBR	CBR	CapVBR
D1	1900	1900	5500	2500	2500	2800	2300
4CIF	1900	1900	5500	2500	2500	2800	2300
Half D1	1000	1000	3000	1400	1400	1700	1300
2CIF	1000	1000	3000	1400	1400		
CIF	500	500	1700	650	650		
QCIF	150	150	500	200	200		

Recommended bitrates for **MPEG-4** encoding.

Resolution	Bitrate (kbps)						
	Min*		Max	Recommended			
				Interlacing toolsets OFF		Interlacing toolsets ON	
	CBR	CapVBR		CBR	CapVBR	CBR	CapVBR
D1	2200	2200	6000	3500	3500	3200	3200
4CIF	2200	2200	6000	3500	3500	3200	3200
Half D1	1200	1200	3200	1900	1900	1800	1800
2CIF	1200	1200	3200	1900	1900		
CIF	600	600	2000	1000	1000		
QCIF	200	200	600	300	300		

Recommended bitrates for **MJPEG** encoding.

Resolution	Bitrate (kbps)						
	Min*		Max	Recommended			
				Interlacing toolsets OFF		Interlacing toolsets ON	
	CBR	CapVBR		CBR	CapVBR	CBR	CapVBR
D1	6000	6000	12000	8000	8000	8000	8000
4CIF	6000	6000	12000	8000	8000	8000	8000
Half D1	3000	3000	6000	4500	4500	4500	4500
2CIF	3000	3000	6000	4500	4500		
CIF	2000	2000	4500	2500	2500		
QCIF	600	600	1300	750	750		

Recommended bitrates for **MPEG-2** encoding.

Resolution	Bitrate (kbps)						
	Min*		Max	Recommended			
				Interlacing toolsets OFF		Interlacing toolsets ON	
	CBR	CapVBR		CBR	CapVBR	CBR	CapVBR
D1	2500	2500	6600	4600	4600	4200	4200
4CIF	2500	2500	6600	4600	4600	4200	4200
Half D1	1300	1300	3500	2500	2500	2300	2300
2CIF	1300	1300	3500	2500	2500		
CIF	700	700	2500	1300	1300		
QCIF	200	200	600	350	350		

Recommended bitrates for **HD** video encoding.

Resolution	Bitrate (Mbps)			
	Recommended			
	H.264	MPEG-4	MPEG-2	MJPEG
720p	4...5	4.6...5.8	8...10	12.6...15.8
1080i60	10...12	11.5...13.8	21...24	31.5...37.8
1080p30	10...12	11.5...13.8	21...24	31.5...37.8

Recommended GOP sizes for **H.264** encoding.

Rate Control Mode	GOP		
	Min	**Max**	**Recommended**
CBR	7	3000	60 -->
Capped VBR	7	3000	15 -->
VBR	7	3000	7 -->

Recommended GOP sizes for **MPEG-4** encoding.

Rate Control Mode	GOP		
	Min	**Max**	**Recommended**
CBR	7	120	60...120
Capped VBR	7	120	15...120
VBR	7	120	7...120

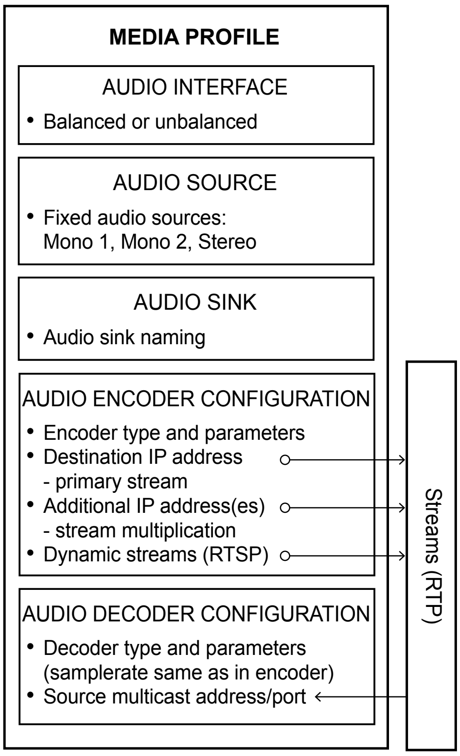
Recommended GOP sizes for **MPEG-2** encoding.

Rate Control Mode	GOP		
	Min	**Max**	**Recommended**
CBR	7	120	60...120
Capped VBR	7	120	15...120
VBR	7	120	7...120

	1080p	**1080i**	**720p**	**D1**	**Half D1**	**4 CIF**	**2 CIF**	**CIF**	**QCIF**	
Field Encoding	Not available			Not available						**H.264 Base Profile (BP) Level 3**
Deinterlacer						x	One field used			
Field Encoding	na	x	na	x		Not available				**H.264 Main Profile (MP) Level 3**
Deinterlacer						x	One field used			
Field Encoding		x		x						**MPEG-2 Main Profile (MP) Main Level**
Deinterlacer						x	One field used			
MBAFF										**MPEG-4 Simple Profile (SP) Level 5**
Deinterlacer						x	One field used			
MBAFF		x		x						**MPEG-4 Advanced Simple Profile (ASP) Level 5**
Deinterlacer						x	One field used			
Field Encoding		x		x						**MJPEG**
Deinterlacer						x	One field used			
Type field value	0			0						
Type specific field values	0	1 & 2	0	1 & 2		0				

Supported interlace coding tools for the MPH video encoders.

Configuring audio channels


MEDIA PROFILE
AUDIO INTERFACE
• Balanced or unbalanced
AUDIO SOURCE
• Fixed audio sources: Mono 1, Mono 2, Stereo
AUDIO SINK
• Audio sink naming
AUDIO ENCODER CONFIGURATION
• Encoder type and parameters
• Destination IP address - primary stream
• Additional IP address(es) - stream multiplication
• Dynamic streams (RTSP)
AUDIO DECODER CONFIGURATION
• Decoder type and parameters (samplerate same as in encoder)
• Source multicast address/port
Streams (RTP)

Description how the audio encoder, audio source, audio input and audio decoder is assembled to the media profile.

Audio connection

MPH200 encoder supports two bi-directional audio channels, which can be used for one stereo audio or two mono audio purposes. The audio interface supports both balanced (both channels separately) and unbalanced wiring. Audio input impedance is 6.6 kΩ in unbalanced mode and 13 kΩ in balanced mode. The device is capable of driving 0.707 Vrms (single-ended output) / 1.414 Vrms (differential output) into a 10 kΩ load. The audio channels operates independently, i.e. despite the absence of all video signals.

> ***Note!*** *Physical audio interface is shared between audio interfaces, so audio interface mode (balanced/unbalanced) and sampling rate configured to each used audio encoder and decoder configuration must be equal.*

Normally audio is transmitted and received in separate RTP streams. However, if video stream is using transport stream (TS), audio packets can be encapsulated inside the same video stream. Note that if audio packets are encapsulated inside the video stream , MPH audio decoder cannot decode it. Audio settings can be configured from web user interface (WebUI).

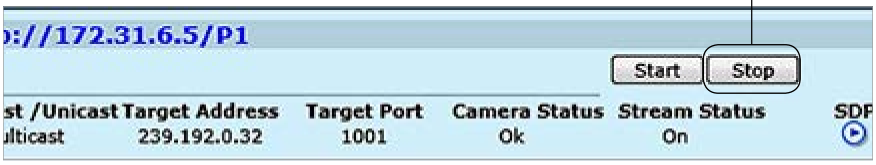
Pin	Balanced signal	Unbalanced signal
1	Audio in -	GND for Audio 1 in
2	Audio in +	Audio 1 in
3	GND (shield)	GND
4	Audio out +	Audio 2 out
5	Audio out -	GND for Audio 2 out

Audio connector’s pinout.

Audio channel configuration

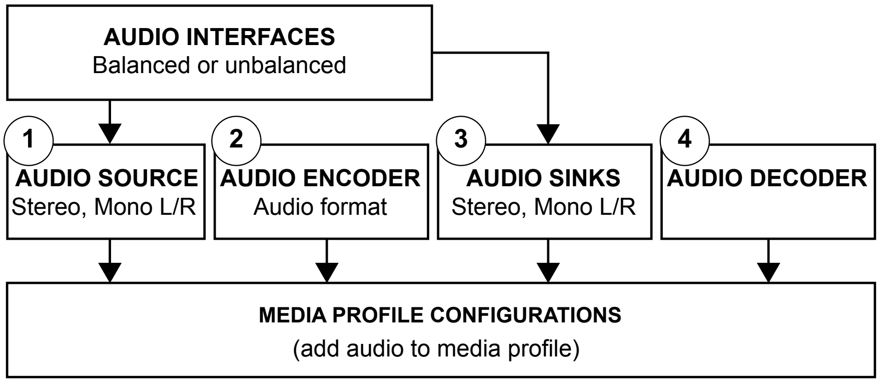
MPH is an ONVIF compliant device and audio channel encoder configuration is designed according to ONVIF standard. Audio decoder is designed similarly but is not according to ONVIF standard.

> ***Note!*** *Before addinging the audio configuration to a video profile, make sure that video stream is stopped on the MAIN page.*



:://172.31.6.5/P1

st /Unicast	Target Address	Target Port	Camera Status	Stream Status	SDF
lticast	239.192.0.32	1001	Ok	On	⊙



Audio configuration flowchart.

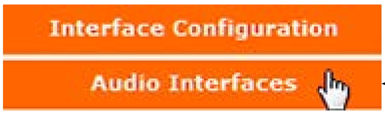
Adding audio encoder to media profile:

1. Add to media profile (Media Configuration/Media Profiles) desired audio source configuration. Choises “Mono Audio In 1”, “Mono Audio In 2”, “Stereo Audio In”.
2. Add to media profile desired audio encoder configuration (Media Configuration/Audio Encoders). Choises are “Audio Encoder - AAC-LC” and “Audio Encoder – G.711”.

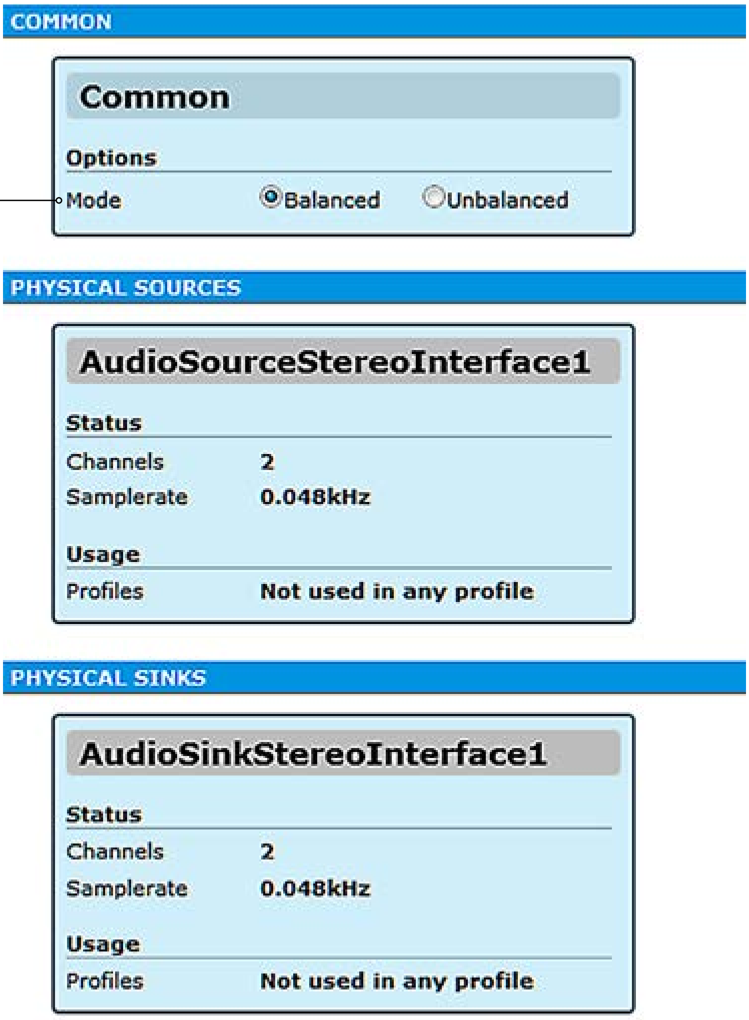
Adding audio decoder to media profile:

3. Add to media profile (Media Configuration/Media Profiles) desired audio source configuration. Choises “Mono Audio In 1”, “Mono Audio In 2”, “Stereo Audio In.
4. Add to media profile desired audio encoder configuration (Media Configuration/Audio Decoders). Choises are “Audio Encoder - AAC-LC” and “Audio Encoder – G.711”.

1. Audio interfaces



Click “**Audio Interfaces**” under the Interface Configuration menu. **Audio Interfaces** page appears on the screen. In this page you can see the number of physical audio inputs available and choose audio input mode (balanced or unbalanced).



COMMON

Common

Options

Mode ● Balanced ○ Unbalanced

Audio interface mode selection. Affects both input and output connection.

PHYSICAL SOURCES

AudioSourceStereoInterface1

Status

Channels	2
Samplerate	0.048kHz

Usage

Profiles	Not used in any profile

PHYSICAL SINKS

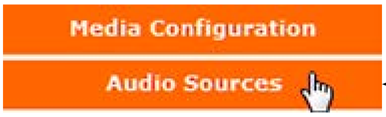
AudioSinkStereoInterface1

Status

Channels	2
Samplerate	0.048kHz

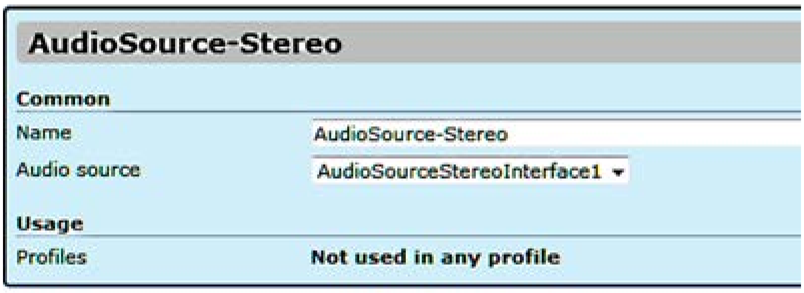
Usage

Profiles	Not used in any profile



2. Audio source and sinks

Click “**Audio Sources**” under the Media Configuration menu. **Audio Source & Sink Configurations** page appears on the screen. You can rename the audio settings name but by default the name describes the physical port location in connector, e.g.“Mono Audio In 1 (pins 1, 2)”.



AudioSource-Stereo

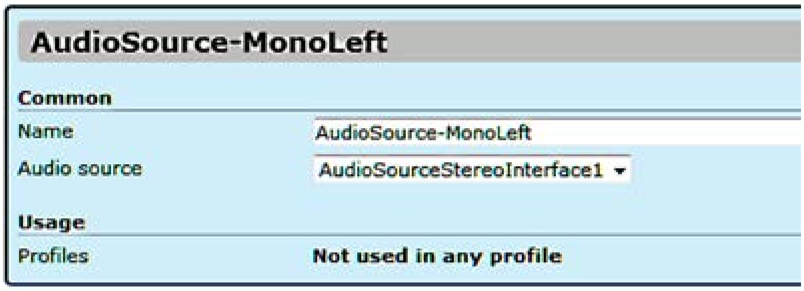
Common

Name: AudioSource-Stereo

Audio source: AudioSourceStereoInterface1

Usage

Profiles: Not used in any profile



AudioSource-MonoLeft

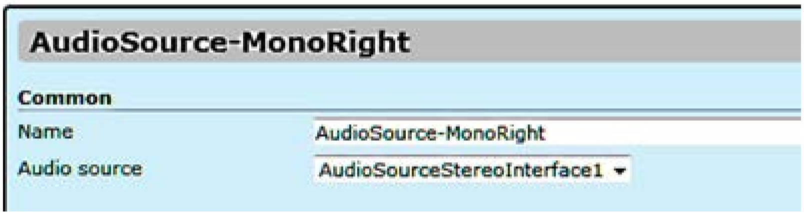
Common

Name: AudioSource-MonoLeft

Audio source: AudioSourceStereoInterface1

Usage

Profiles: Not used in any profile

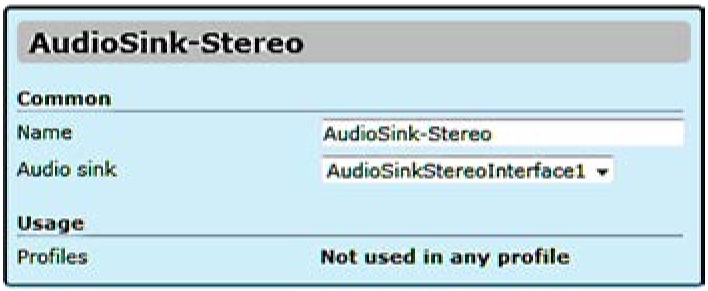


AudioSource-MonoRight

Common

Name: AudioSource-MonoRight

Audio source: AudioSourceStereoInterface1



AudioSink-Stereo

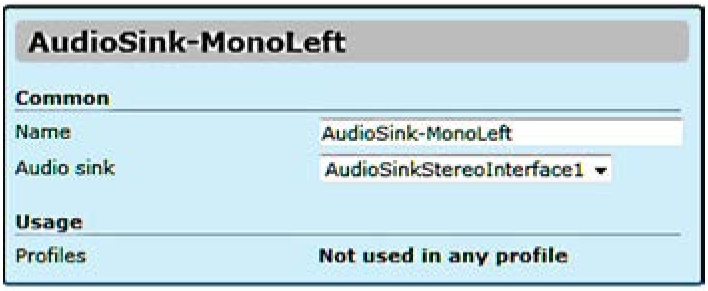
Common

Name: AudioSink-Stereo

Audio sink: AudioSinkStereoInterface1

Usage

Profiles: Not used in any profile



AudioSink-MonoLeft

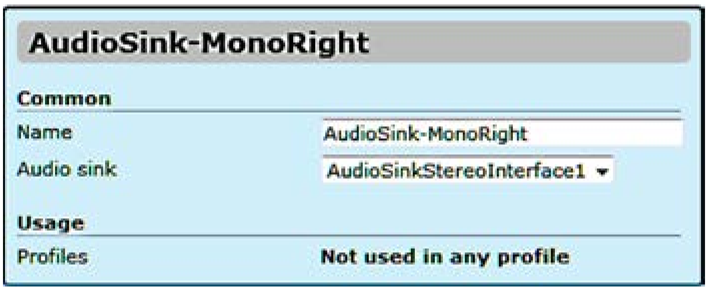
Common

Name: AudioSink-MonoLeft

Audio sink: AudioSinkStereoInterface1

Usage

Profiles: Not used in any profile



AudioSink-MonoRight

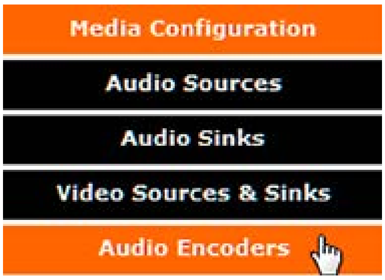
Common

Name: AudioSink-MonoRight

Audio sink: AudioSinkStereoInterface1

Usage

Profiles: Not used in any profile

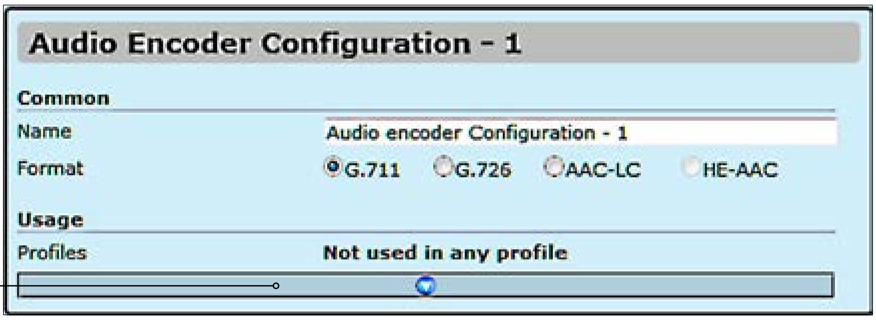


3. Audio encoders

Click “**Audio Encoders**” under the Media Configuration menu. **Audio Encoder Configurations** page appears on the screen. Audio encoding settings can be configured on this page, e.g. select format: G.711 (uLaw), G.726 (ADPCM), AAC-LC or HE-AAC, set samplerate, bit rate, format and multicast IP/port settings for each profile.

This page contains (by default) four different customizable encoding profiles. This feature allows you to set four different audio encoding combinations, each with their own settings.

On this page you can also add multiplied multicast/unicast streams from each encoder.



Audio Encoder Configuration - 1

Common

Name: Audio encoder Configuration - 1

Format: ● G.711 ○ G.726 ○ AAC-LC ○ HE-AAC

Usage

Profiles: Not used in any profile

Click this to see more settings.

AUDIO ENCODER CONFIGURATIONS page.

Common

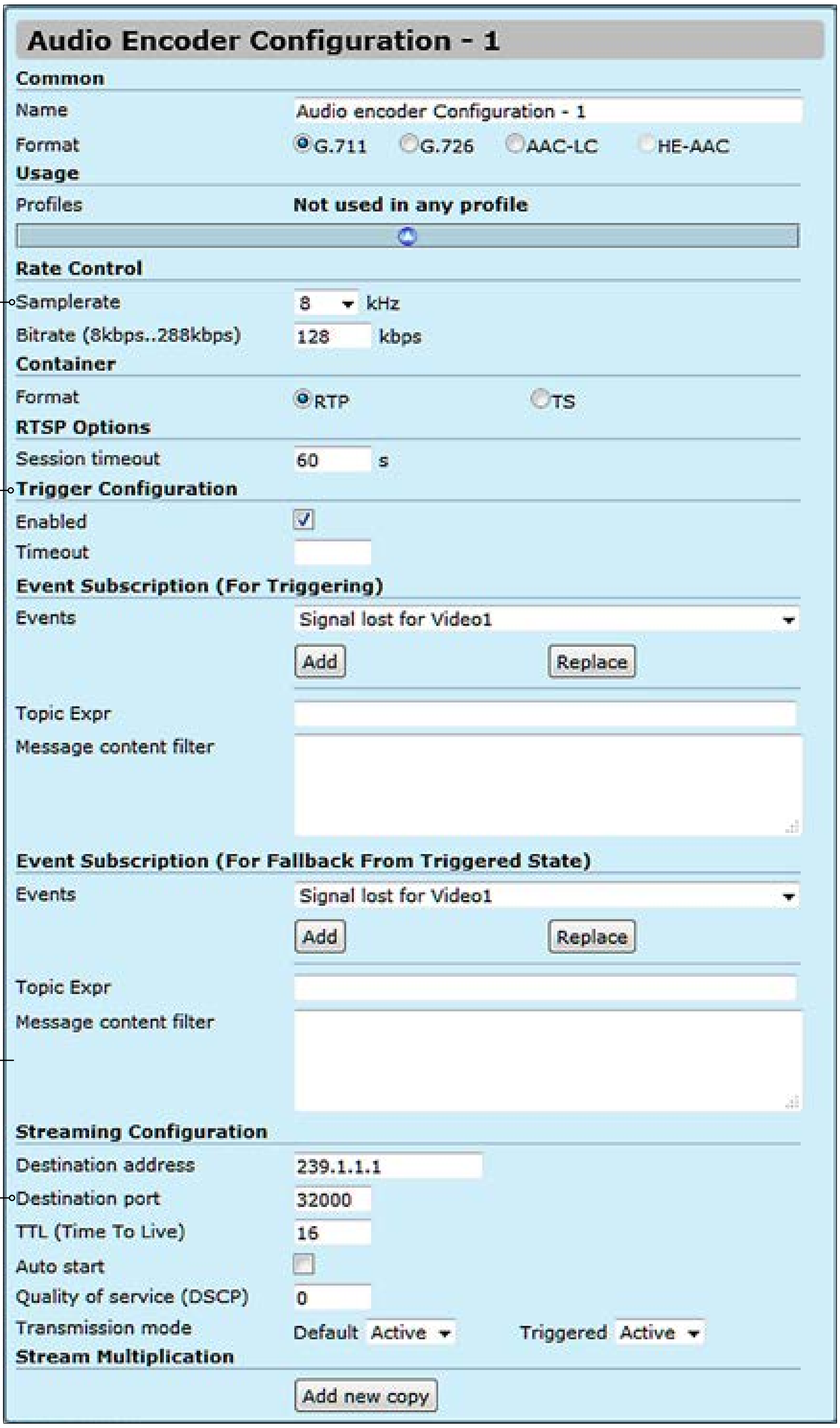
Name: User defined alias name for audio profile (max 63 chars).

Format: Audio format, either G.711, G.726, AAC-LC or HE-AAC.

Note! *Samplerate value has to be same at both encoder and corresponding decoders.*

Trigger Configuration
See section "Event management system" from page 60 for more details.

Note! *Only even port numbers can be used for RTP, and then the following odd port number shall be used for RTCP (RFC 1889).*



Audio Encoder Configuration - 1

Common

Name: Audio encoder Configuration - 1

Format: ● G.711 ○ G.726 ○ AAC-LC ○ HE-AAC

Usage

Profiles: **Not used in any profile**

Rate Control

Samplerate: 8 kHz

Bitrate (8kbps..288kbps): 128 kbps

Container

Format: ● RTP ○ TS

RTSP Options

Session timeout: 60 s

Trigger Configuration

Enabled: ☑

Timeout:

Event Subscription (For Triggering)

Events: Signal lost for Video1

Topic Expr:

Message content filter:

Event Subscription (For Fallback From Triggered State)

Events: Signal lost for Video1

Topic Expr:

Message content filter:

Streaming Configuration

Destination address: 239.1.1.1

Destination port: 32000

TTL (Time To Live): 16

Auto start: □

Quality of service (DSCP): 0

Transmission mode: Default Active Triggered Active

Stream Multiplication

AUDIO ENCODER CONFIGURATIONS page.

Usage

Profiles: Here you see how the media profile is assigned to a audio source.

Rate control:

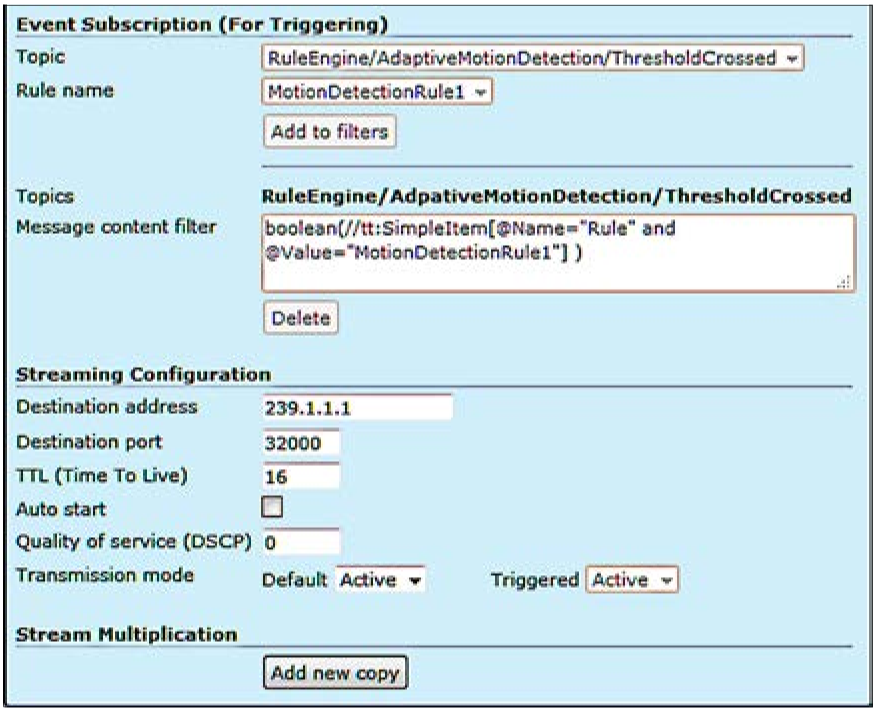
Samplerate: Defines audio codecs samplerate value (8/16/32/44.1 or 48 KHz). Setting a higher samplerate value improves audio file quality and increases its size.

Bitrate: Defines encoded audio bitrate (8..288 kbps). The higher the rate is, the better the quality of sound is. However this also increases the file size.

Container: RTP (Real-time Transport Protocol) or TS (MPEG transport stream).

RTSP Options:

Session tmeout: Timeout for RTSP session.



Event Subscription (For Triggering)

Topic: RuleEngine/AdaptiveMotionDetection/ThresholdCrossed ▾

Rule name: MotionDetectionRule1 ▾

Topics: **RuleEngine/AdpativeMotionDetection/ThresholdCrossed**

Message content filter: boolean(//tt:SimpleItem[@Name="Rule" and @Value="MotionDetectionRule1"])

Streaming Configuration

Destination address: 239.1.1.1

Destination port: 32000

TTL (Time To Live): 16

Auto start: □

Quality of service (DSCP): 0

Transmission mode: Default Active ▾ Triggered Active ▾

Stream Multiplication

Trigger configuration:

Enabled: Enables or disables the trigger feature

Timeout: Keeps the event state unchanged for the defined period for instance if an event clears quickly, it does not change its state for the defined timeout, recommended 5 seconds.

Event subscription (for triggering):

Events: Select the event type

Topic Expr: The topic expression of the event

Message content filter: Event description, filter and values

Streaming Configuration:

Destination address: Destination IP address. **Multicast**: Multicast IP address / multicast group. This multicast IP address has to be same at both encoder and corresponding decoders. **Unicast**: IP address of receiving decoder.

Destination port: UDP port number (0...65536). This number has to be same at both encoder and decoder pairs. Port number needs to be even, as next odd port is allways used for RTCP traffic.

TTL (Time To Live): Time-To-Live for video packets = number of hops that a packet is permitted to travel before being discarded by a router (0...255).

Auto start: Audio streaming will automatically start after reboot. Changing autostart does not immediately start or stop streams.

Quality of Service (DSCP): (Differentiated Services Code Point) field lets you set bits in the stream IP header allowing a network device to apply rules such as how the packet is forwarded in the network and QoS (Quality of service) management.

Transmission mode: **Default** = Normal audio transmission mode:

- **Active**: Audio is transmitted.
- **Paused**: Audio encoder is ready but paused (no packets trasmitted).

Triggered = Audio is configured with triggering feature:

- **Active**: Audio is transmitted.
- **Paused**: Audio encoder is ready but paused (no packets trasmitted).

Audio stream multiplication

Each audio encoding profile can be assigned with five (5) different destination addresses (primary stream and additional streams). These addresses can be freely set to unicast, multicast or a combination of these.

The use of multiple destination addresses up to a certain degree doesn’t load the MPU; however one should take into account that the aggregate bit rate of all output streams does not exceed the capacity of the 100Mbps interface.

Stream multiplication:

Destination address: Destination IP address. **Multicast**: Multicast IP address / multicast group. This multicast IP address has to be same at both encoder and corresponding decoders. **Unicast**: IP address of receiving decoder.

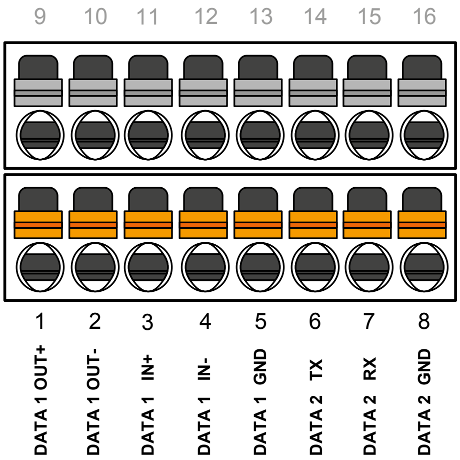
Destination port: UDP port number (0...65536). This number has to be same at both encoder and decoder pairs.

Quality of Service (DSCP/DiffServ): Differentiated Services Code Point field lets you set bits in the stream IP header allowing a network device to apply rules such as how the packet is forwarded in the network and QoS (Quality of service) management.

Transmission mode: **Active**: Audio is transmitted.
Paused: Audio encoder is ready but paused (no packets trasmitted).

Add new copy : Adds new copy from stream.

Configuring data channels



Lower screw terminal connector on front panel is used for data connections.

Data connections

The MPH200 encoder provides two independent bi-directional data channels. Supported data modes for data channel 1 are **RS422**, **RS485-2w** and **RS485-4w**. Data channel 2 is fixed for **RS232** mode only. Data port settings can be configured from web user interface (WebUI) or Command Line Interface (CLI).

Data channel 1 is fully configurable and supports RS422, RS485 2-wire and RS485 4-wire modes .**ONVIF PTZ** service is only available from data channel 1, whereas data channel 2 is used either for RS232 data mode or command-line interface usage. Both channels support tunnelling protocol and can be connected to the PTZ controller application.

The default factory settings are:

- Data channel 1: **RS485-2w**
- Data channel 2: mode is set to **CLI** (Command Line Interface) usage

Pin	Signal	RS232	RS422	RS485-2w	RS485-4w
1	Data 1		OUT +		OUT +
2			OUT -		OUT -
3			IN +	IN/OUT +	IN +
4			IN -	IN/OUT -	IN -
5			GROUND	GROUND	GROUND
6	Data 2	TX			
7		RX			
8		GROUND			

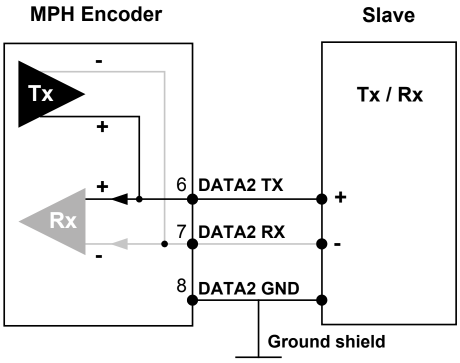
Data connector's pinout and supported data types.

Led	Colour	Mode
T	Green	Active Connection. Terminal server TCP connection is established.
	Blinking Green	On stream.
	OFF / Dark	No stream.

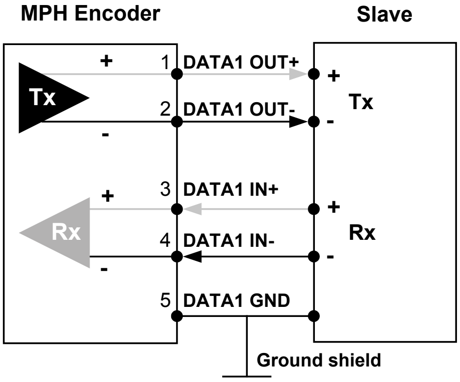
T - (terminal server) Led indicator operation. This LED indicates the status of Terminal server activity on RS422/485 port.

	Data 1	Data 2
Tunnelling protocol	x	x
ONVIF PTZ protocol	x	
RS232		x
RS422, RS485	x	
Command line interface		X

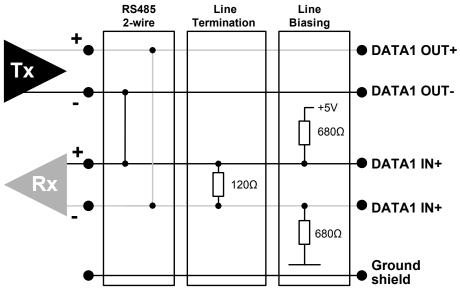
MPH unit provides two data channels for PTZ cameras on Terminal server page.



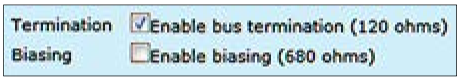
RS485-2w data connection diagram.
A 2-wire RS485 network is implemented as a half-duplex system using single twisted-pair cabling. This means that data can flow in both directions but only in one direction at a time.



RS422 / RS485-4w data connection diagram.
A 4-wire RS485 network can be implemented as a full-duplex system using two twisted-pair buses where each bus is used for each direction of transmission.



MPH's internal functionality for data channel 1 termination and biasing.



Termination ☑Enable bus termination (120 ohms)
Biasing □Enable biasing (680 ohms)

Termination and biasing settings view from WebUI.

Data type descriptions

RS232 is an unbalanced data format (i.e. the signal wire working against a reference – ground). Simplex RS232 requires two connections (signal and ground). Full-duplex RS232 requires three connections (signal TX, signal RX and ground).

RS422 is a balanced data format. Simplex RS422 requires three data connections (+/- and ground). Full-duplex RS422 requires five data connections (in+/in-, out+/out- and ground).

RS485 is used for full-multipoint communications where multiple transceiver devices may be connected to a single twisted-pair signal cable. Most RS485 systems use a Master/Slave architecture, where each Slave unit has a unique address and responds only to packets addressed to that unit. Packets are generated by the Master (e.g. CCTV controller keyboard), which periodically 'polls' all connected Slave units (e.g. CCTV camera receiver units). The Slave unit that has been addressed then sends the appropriate reply packet back to the Master. Slave units have no means of initiating communication without the risk of a collision so they need to be assigned the 'right to transmit' by the Master (by polling). RS485 exists in two versions, 2-wire and 4-wire.

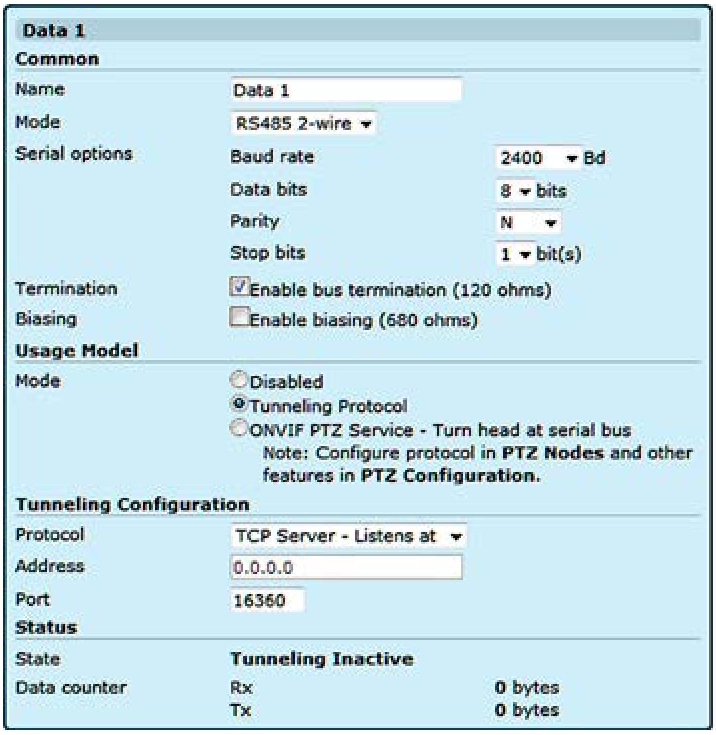
Data termination and biasing

Termination is used to match impedance of a node to the impedance of the transmission line being used. When impedance are mismatched, the transmitted signal is not completely absorbed by the load and a portion is reflected back into the transmission line. If the source, transmission line and load impedance are equal these reflections are eliminated.

Biasing -> the lines will be biased to known voltages and nodes will not interpret the noise from undriven lines as actual data; without biasing resistors, the data lines float in such a way that electrical noise sensitivity is greatest when all device stations are silent or unpowered.

Data mode	Input termination options
RS232	None
RS422	No term (with failsafe) Line termination (120 Ω)
RS485 - 2w	No term (with failsafe) Hard bias (forced 680 Ω line biasing) Line termination (120 Ω)
RS485 - 4w	No term (with failsafe) Hard bias (forced 680 Ω line biasing) Line termination (120 Ω)

Data input termination options for data channels. Data termination connects 120 Ω between pins. Hard bias connects 680 Ω (+input) to +5V and GND (- input).



Data 1

Common

Name	Data 1	
Mode	RS485 2-wire	
Serial options	Baud rate	2400 Bd
	Data bits	8 bits
	Parity	N
	Stop bits	1 bit(s)
Termination	☑ Enable bus termination (120 ohms)	
Biasing	☐ Enable biasing (680 ohms)	

Usage Model

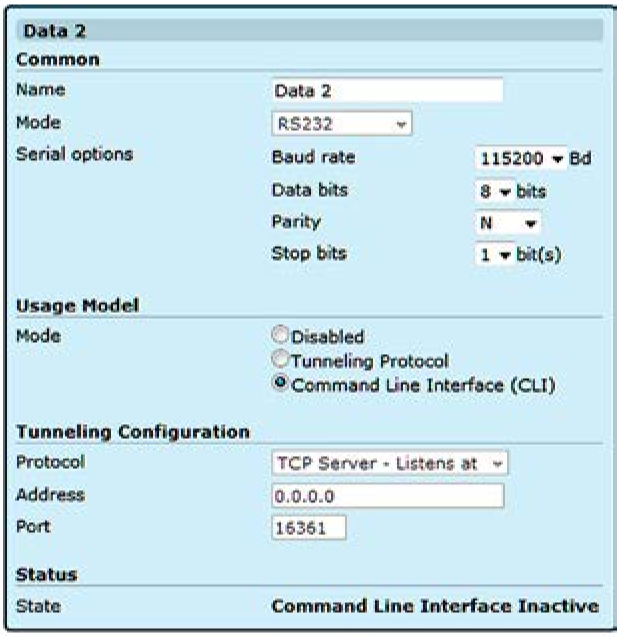
Mode
○ Disabled
● Tunneling Protocol
○ ONVIF PTZ Service - Turn head at serial bus
Note: Configure protocol in **PTZ Nodes** and other features in **PTZ Configuration.**

Tunneling Configuration

Protocol	TCP Server - Listens at
Address	0.0.0.0
Port	16360

Status

State	**Tunneling Inactive**	
Data counter	Rx	**0** bytes
	Tx	**0** bytes



Data 2

Common

Name	Data 2	
Mode	RS232	
Serial options	Baud rate	115200 Bd
	Data bits	8 bits
	Parity	N
	Stop bits	1 bit(s)

Usage Model

Mode
○ Disabled
○ Tunneling Protocol
● Command Line Interface (CLI)

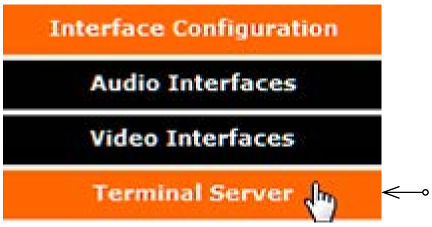
Tunneling Configuration

Protocol	TCP Server - Listens at
Address	0.0.0.0
Port	16361

Status

State	**Command Line Interface Inactive**

Data interfaces configuration



An analog PTZ camera can be controlled remotely over an IP network via the MPH encoder's serial port (RS-232/422/485). MPH encoders supports two ways to control PTZ camera, ONVIF PTZ service and transparent RS-data tunneling.

Click "**Terminal Server**" under the Interface Configuration menu. **Terminal Server - Data Ports** page appears on the screen. Data port settings can be changed on this page.

Data 1 & 2 (WebUI)

Common

Name: User defined alias name for data interface (max 64 chars)

Mode: Data connection protocol towards the external device, options are RS422, RS485 2-wire and RS485 4-wire (Data 1) and RS232 (Data 2)

Baud rate: Data channel connection speed (range 600...230 400 bps)

Data bits: Number of data bits. Options are 5, 6, 7, 8 & 9

Parity: A data-checking technique, which uses an extra bit, Options are Even, Odd & N (None)

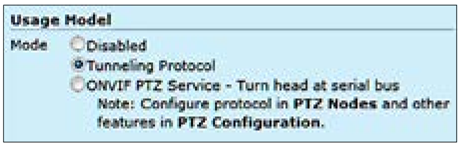
Stop bits: Options are 1 or 2

Termination: Enabled/disabled (Data 1). The dafault setting is enabled.

Biasing: Enabled/disabled (Data 1). The dafault setting is disabled.

Usage Model

Mode: Data usage mode. By MPH encoder you can control PTZ cameras via two protocols, Tunnelling Protocol and OnVIF.



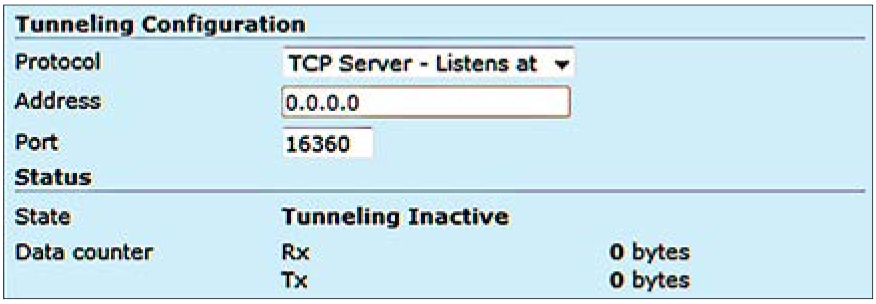
Usage Model

Mode
○ Disabled
● Tunneling Protocol
○ ONVIF PTZ Service - Turn head at serial bus
Note: Configure protocol in **PTZ Nodes** and other features in **PTZ Configuration**.

Data port mode can be set to the tunneling protocol usage from the Terminal Server page.

Tunneling protocol

Tunnelling Protocol enables you to establish point to point connection between encoder, decoder and management system. There are three options, TCP server, TCP client and UDP multicast.



Tunneling Configuration		
Protocol	TCP Server - Listens at ▾	
Address	0.0.0.0	
Port	16360	
Status		
State	**Tunneling Inactive**	
Data counter	Rx	**0** bytes
	Tx	**0** bytes

Tunneling Configuration

Protocol: Client / server based connected is done by TCP client / server protocol. If the encoder is set to be “TCP Server”, then the decoder or management system must be set to “TCP Client”, or vice versa. In UDP multicast mode, you can use a joystick to control multiple cameras and connection can be point to multipoint.

Address: Destination IP address

Port: UDP port number (0...65535). This number has to be same at both encoder and decoder pairs

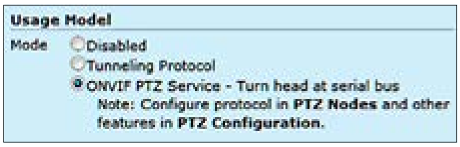
Status

State: Shows data port’s state.

Note*! In order to have correct channel status information, you can check the followings:*

- *Device address is configured correctly in PTZ nodes page.*
- *Serial Port configuration : connection mode (RS-485 4-wire, etc), Baud rate, and parity. in terminal server page.*
- *PTZ configuration is added to a media profile. PTZ configuration “PTZ1” by default is added to media Profile 1.*

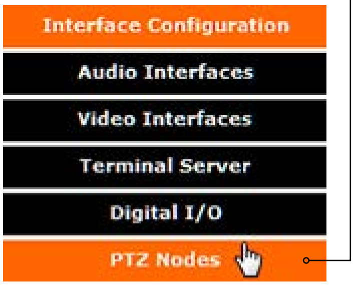
Data counter: Data port’s traffic counter.

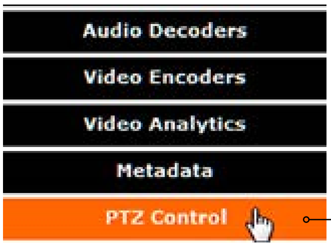


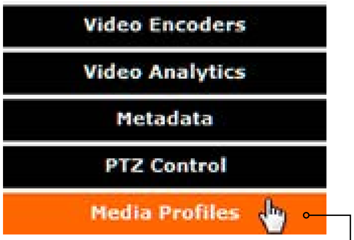
Usage Model

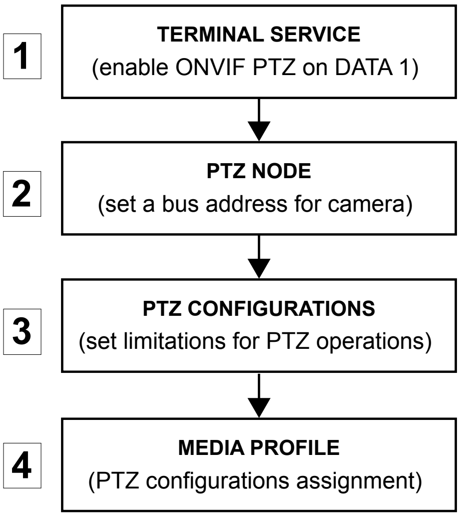
Mode
○ Disabled
○ Tunneling Protocol
● ONVIF PTZ Service - Turn head at serial bus
Note: Configure protocol in **PTZ Nodes** and other features in **PTZ Configuration**.

In order to activate the ONVIF PTZ protocol, data port mode must be first set to the ONVIF PTZ service usage from the Terminal Server page.









1 TERMINAL SERVICE (enable ONVIF PTZ on DATA 1)

2 PTZ NODE (set a bus address for camera)

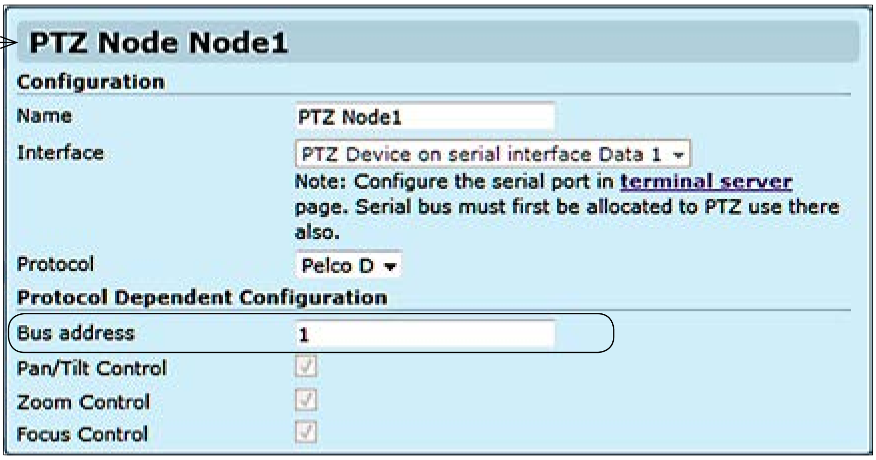
3 PTZ CONFIGURATIONS (set limitations for PTZ operations)

4 MEDIA PROFILE (PTZ configurations assignment)

Step-by-step flowchart how to configure ONVIF PTZ data 1 channel in the MPH encoder.

ONVIF PTZ service

ONVIF PTZ service lets you control the camera from ONVIF client application. ONVIF PTZ service is available from data channel 1. It means that MPH converts ONVIF PTZ commands to Pelco D commands and transmits that to the camera via Data channel 1.



PTZ Node Node1

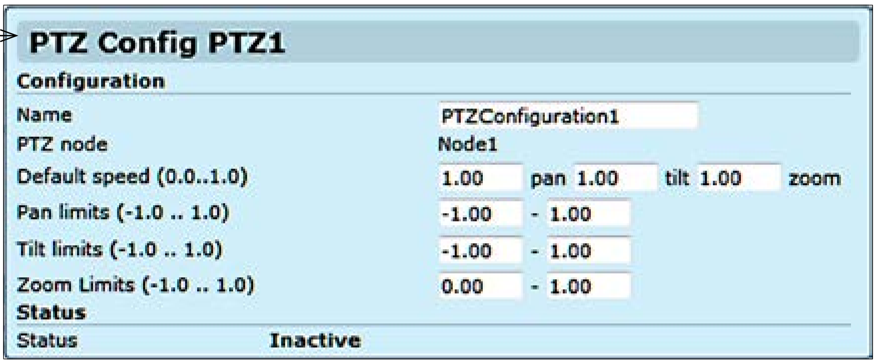
Configuration

Name	PTZ Node1
Interface	PTZ Device on serial interface Data 1 ▾ Note: Configure the serial port in terminal server page. Serial bus must first be allocated to PTZ use there also.
Protocol	Pelco D ▾

Protocol Dependent Configuration

Bus address	1
Pan/Tilt Control	☑
Zoom Control	☑
Focus Control	☑

2. Next on the PTZ Nodes page you need to set a Bus address for the camera, you can have two cameras using the same Data port with different bus addresses.



PTZ Config PTZ1

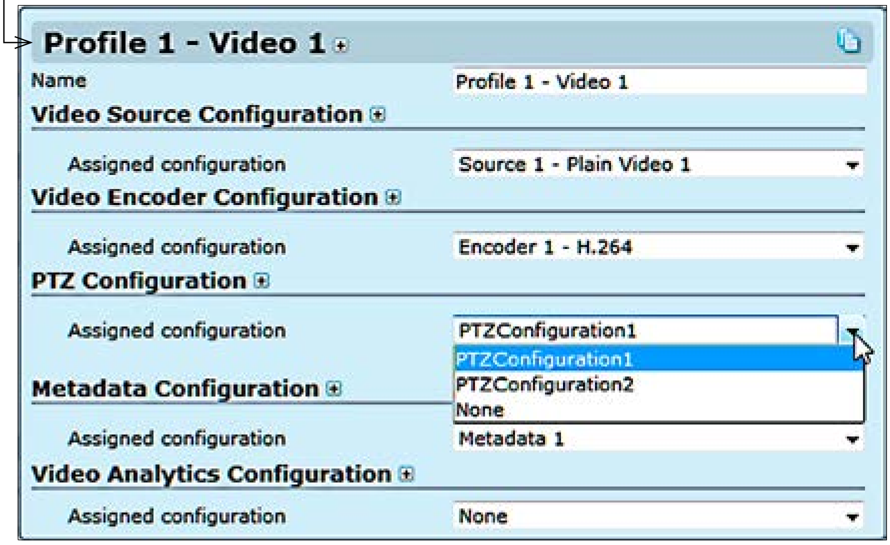
Configuration

Name	PTZConfiguration1					
PTZ node	Node1					
Default speed (0.0..1.0)	1.00	pan	1.00	tilt	1.00	zoom
Pan limits (-1.0 .. 1.0)	-1.00	-	1.00			
Tilt limits (-1.0 .. 1.0)	-1.00	-	1.00			
Zoom Limits (-1.0 .. 1.0)	0.00	-	1.00			

Status

Status **Inactive**

3. Then on the PTZ configurations page you can set limitations for PTZ operations. For each PTZ node you can limit speed, pan, tilt and zoom.



Profile 1 - Video 1

Name: Profile 1 - Video 1

Video Source Configuration

Assigned configuration: Source 1 - Plain Video 1 ▾

Video Encoder Configuration

Assigned configuration: Encoder 1 - H.264 ▾

PTZ Configuration

Assigned configuration: PTZConfiguration1 ▾
PTZConfiguration1
PTZConfiguration2
None

Metadata Configuration

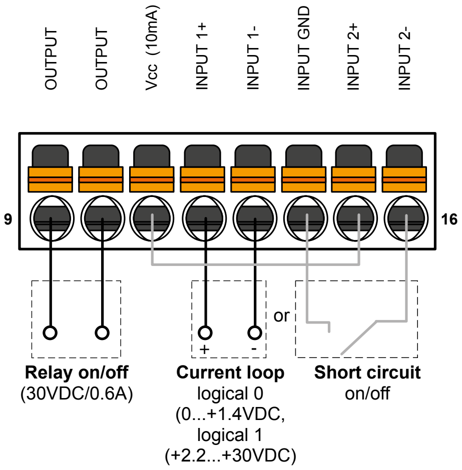
Assigned configuration: Metadata 1 ▾

Video Analytics Configuration

Assigned configuration: None ▾

4. Finally on the Media profiles page you need to assign the PTZ configuration to the media profile where the camera is connected to.

Configuring contact closure channels



Upper screw terminal connector (pins 9...16) on front panel is used for contact closure connections.

Contact closure loop (CCL) connection

The **MPH200** series video encoders provide two inputs and one contact closure output channel line.

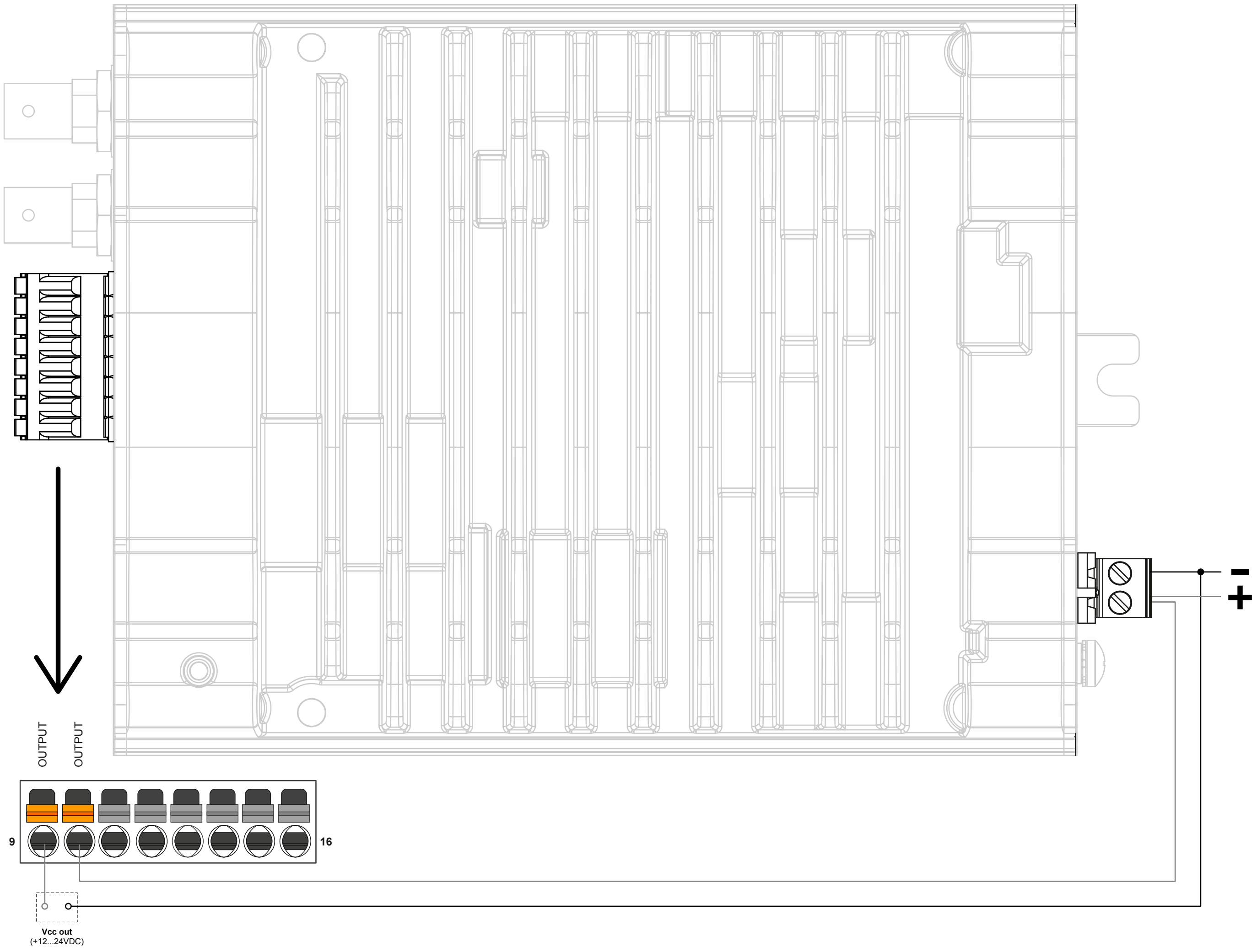
Contact closure inputs

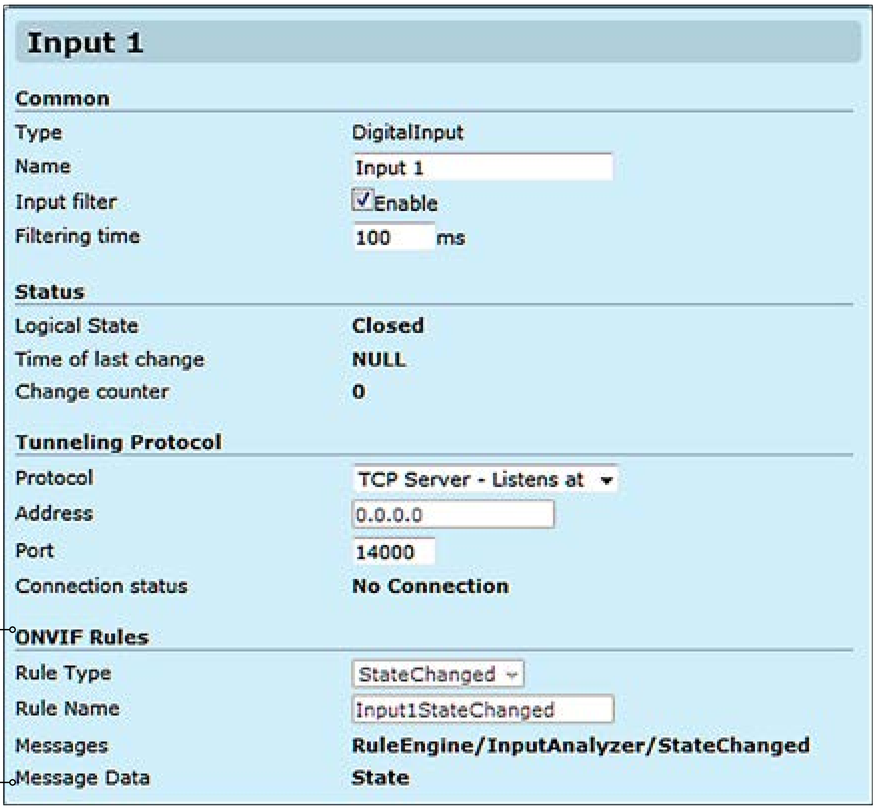
There are two different CC input connection types. First one is for a normal short circuit which is called “dry contact closure”. Dry contact closure enables you to switch ON & OFF input signals between connector’s contact pins (internal power source). Second type is called “Optoisolated” current loop input signals (logical 0 = 0.0VDC...+1.4VDC and logical 1 = +2.2VDC...+30.0VDC) between contact pins (external power source). Input pins nominal current consumption is 3 mA.

Contact closure output

CC output is a normal relay on/off - output signal (30V / 0.6A) between connector’s contact pins.

***Note**! If voltage output is needed from output, do not use Vcc (10mA) pin for it. Instead use external voltage source or device power supply for it. See an example connection bottom.*





Input 1

Common

Type DigitalInput

Name Input 1

Input filter ☑ Enable

Filtering time 100 ms

Status

Logical State **Closed**

Time of last change **NULL**

Change counter **0**

Tunneling Protocol

Protocol TCP Server - Listens at

Address 0.0.0.0

Port 14000

Connection status **No Connection**

ONVIF Rules

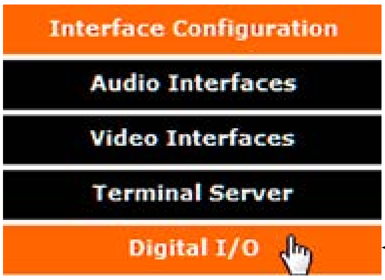
Rule Type StateChanged

Rule Name Input1StateChanged

Messages **RuleEngine/InputAnalyzer/StateChanged**

Message Data **State**

Device generates events from changes in digital input states. Events are used internally to trigger configuration changes in video encoding or provided for ONVIF clients through metadata streams and ONVIF notification interfaces (Real Time Notification Interface and Base Notification Interface).



Contact closure interfaces configuration

Click "**Digital I/O**" under the Interface Configuration menu. **Contact Closure / Inputs & Outputs** page appears on the screen. Contact closure settings can be changed on this page.

Contact closure input 1 & 2

Common

Name: User defined alias name for contact closure interface (max 64 chars)

Input filter: Monitors how many state changes happen (from close to open or vice versa) during the time frame given by "Filter Time" parameter. If during this time frame CC input state changes more than once, the input state is set as "unstable".

Filtering time: Time frame for "Input Filter" (100...2000 ms).

Status

Logical State: The default state for CC input (open/closed).

Time of last change: Shows the time when the last cc state was changed.

Change counter: Shows the total number of state changes that has been registered by a given input CC.

Tunneling protocol

Protocol: IP connection type. There are three options: "TCP Client - Connects to" , "TCP Server - Listens at" and "UDP multicast - Sends to".

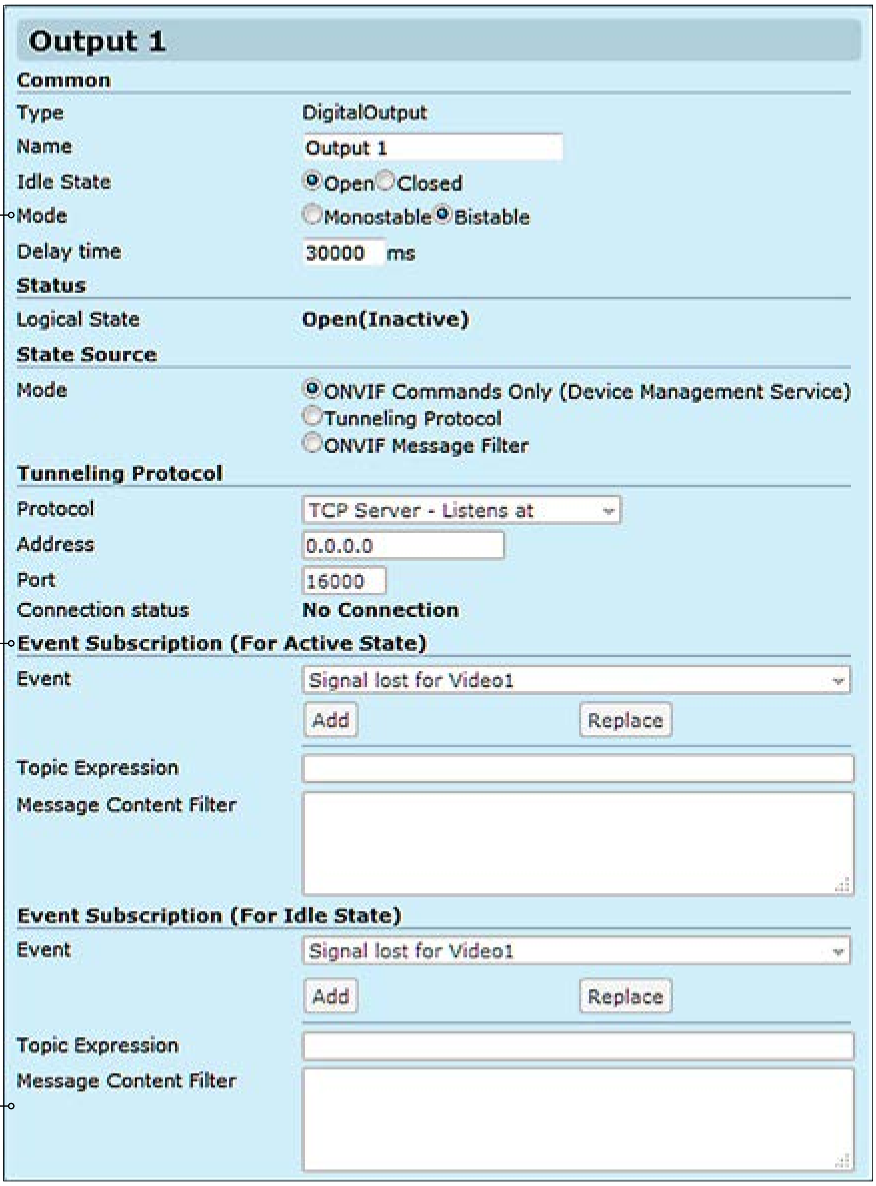
Address: Destination IP address.

Port: UDP port number (0...65535). This number has to be same at both encoder and decoder pairs.

Connection status: Shows connection status. The status can be active, disabled or no connection.

Bistable – *After changing the state, the relay remains in this state.*
Monostable – After changing the state, the relay returns to its idle state after the specified time.

Note! *When Contact closure tunneling is used, Bistable mode is only applicable. Monostable mode is applicable when relay output is controlled by ONVIF commands from ONVIF client.*



Output 1

Common

Type	DigitalOutput
Name	Output 1
Idle State	● Open ○ Closed
Mode	○ Monostable ● Bistable
Delay time	30000 ms

Status

Logical State	**Open(Inactive)**

State Source

Mode	● ONVIF Commands Only (Device Management Service) ○ Tunneling Protocol ○ ONVIF Message Filter

Tunneling Protocol

Protocol	TCP Server - Listens at
Address	0.0.0.0
Port	16000
Connection status	**No Connection**

Event Subscription (For Active State)

Event	Signal lost for Video1
Topic Expression	
Message Content Filter	

Event Subscription (For Idle State)

Event	Signal lost for Video1
Topic Expression	
Message Content Filter	

Trigger Configuration
See section "Event management system" from page 60 for more details.

Contact closure output

CC output can be controlled either with ONVIF Commands (SetRelay-OutputState) or by receiving state using tunneling protocol.

Common

Name: User defined alias name for contact closure interface (max 64 chars)

Idle State: User defined default standby mode for contact closure output pins.
Open means that the output relay is open in inactive mode.
Close means the output relay is closed in inactive mode.

Mode: Contact closure output state mode, either Monostable or Bistable.

Delay time: Time period in monostable mode when state changes back to the idle state.

Status

Logical State: Current CC output state.

State Source

Mode: Definition how to control the CC output. Options are:
ONVIF Commands only, Tunneling Protocol and ONVIF Message Filter

Tunneling protocol

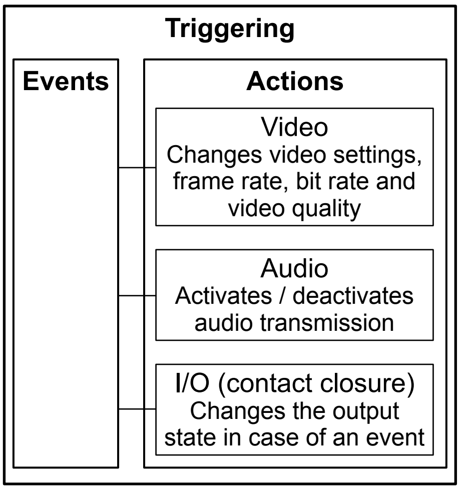
Protocol: There are three connection types. Point-to-point (Client/server) based connection which is done by TCP client / server protocol. If the encoder is set to be **TCP Server**, then the decoder or management system must be set to **TCP Client**, or vice versa. In UDP multicast mode, you can control multiple devices and connection can be point to multipoint.

Address: Destination IP address

Port: UDP port number (0...65535). This number has to be same at both encoder and decoder pairs

Connection status: Current CC connection status

Event management


Triggering
Events
Actions
Video
Changes video settings, frame rate, bit rate and video quality
Audio
Activates / deactivates audio transmission
I/O (contact closure)
Changes the output state in case of an event

Flowchart how MPH triggers actions to different events.

General

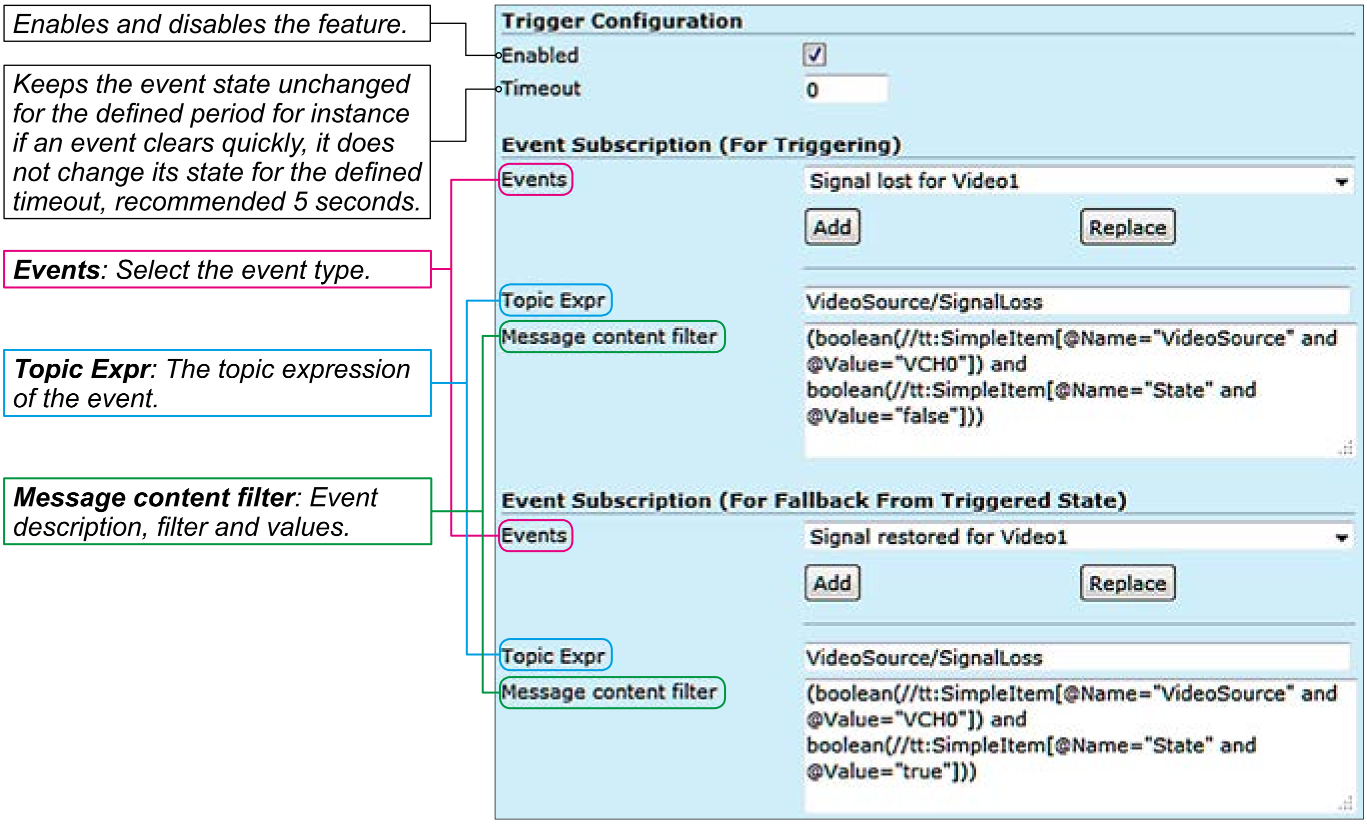
MPH internally controls events as specified by ONVIF. Events are generated from digital IO inputs, motion detection, tampering detection and video signal loss and each of those generate event with different topic.

Operation

MPH can trigger actions for video, audio and contact closers output. These events are also available for video management system to trigger configurable alarms. You can add multiples event at the same time and each one triggers action.

Following events are available:

Event	
Signal lost for video 1 and 2	Signal restored for video 1 and 2
I/O Inputs activation	I/O Inputs deactivation
Motion Detection above the threshold for video 1 and 2	Motion Detection below the threshold for video 1 and 2
Camera tampered	Camera tamper removed



Enables and disables the feature.

Keeps the event state unchanged for the defined period for instance if an event clears quickly, it does not change its state for the defined timeout, recommended 5 seconds.

***Events**: Select the event type.*

***Topic Expr**: The topic expression of the event.*

***Message content filter**: Event description, filter and values.*

Trigger Configuration

Enabled ☑

Timeout 0

Event Subscription (For Triggering)

Events: Signal lost for Video1

Topic Expr: VideoSource/SignalLoss

Message content filter:

```
(boolean(//tt:SimpleItem[@Name="VideoSource" and
@Value="VCH0"]) and
boolean(//tt:SimpleItem[@Name="State" and
@Value="false"]))
```

Event Subscription (For Fallback From Triggered State)

Events: Signal restored for Video1

Topic Expr: VideoSource/SignalLoss

Message content filter:

```
(boolean(//tt:SimpleItem[@Name="VideoSource" and
@Value="VCH0"]) and
boolean(//tt:SimpleItem[@Name="State" and
@Value="true"]))
```

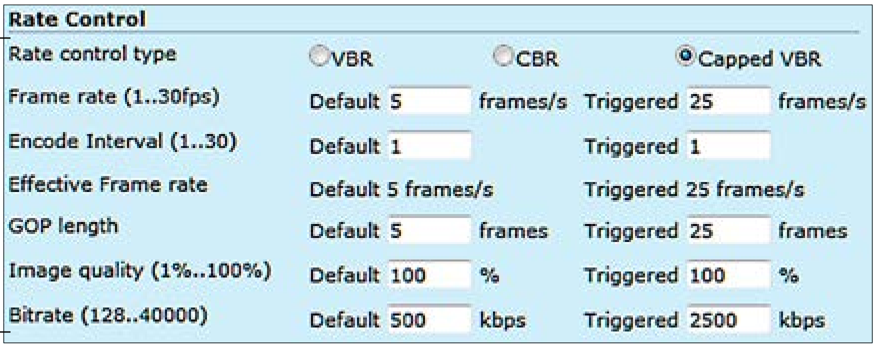
In addition to event topics, events contain data describing the event such as the video interface related, amount of motion and threshold, etc.

The event data is available in the “Message Content filter” box, which is XPath format for matching XML content. Triggering occurs when defined “Topic expression” and “message content filter” matches the internal event.

Video triggering

For video the triggering can trigger actions such as changing video settings, frame rate, bit rate and video quality for each video profile based on events.

An example from Video Encoder Configurations page shows: The video bit rate and frame rate change when an event triggered.



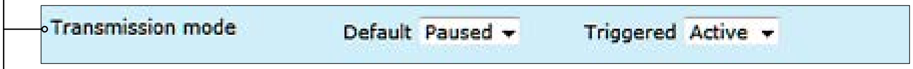
Rate Control

Rate control type	○VBR ○CBR	●Capped VBR
Frame rate (1..30fps)	Default 5 frames/s	Triggered 25 frames/s
Encode Interval (1..30)	Default 1	Triggered 1
Effective Frame rate	Default 5 frames/s	Triggered 25 frames/s
GOP length	Default 5 frames	Triggered 25 frames
Image quality (1%..100%)	Default 100 %	Triggered 100 %
Bitrate (128..40000)	Default 500 kbps	Triggered 2500 kbps

Audio triggering

For audio the triggering can activate or deactivate audio transmission.

An example from Audio Encoder Configurations page shows: Audio stream is paused in normal mode but when an event triggered, it starts streaming.

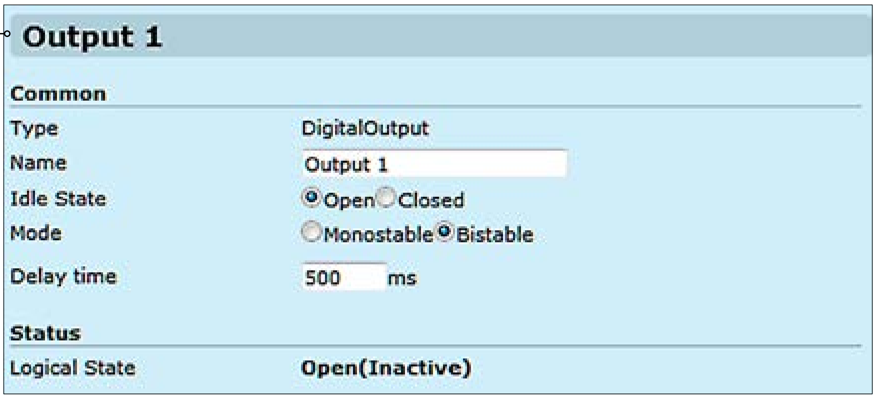


Transmission mode	Default Paused ▾	Triggered Active ▾

Contact Closure triggering

For contact closure (digital I/O) the triggering changes the output state in case of an event.

An example from Digital I/O page.



Output 1

Common

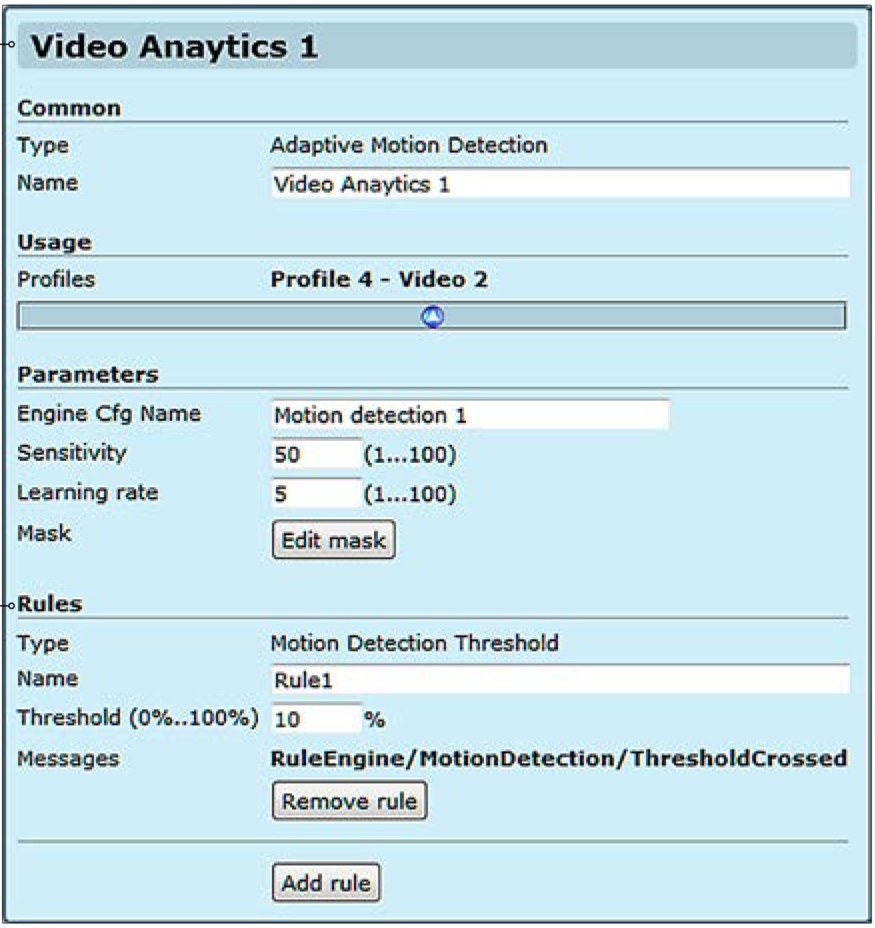
Type	DigitalOutput
Name	Output 1
Idle State	●Open ○Closed
Mode	○Monostable ●Bistable
Delay time	500 ms

Status

Logical State	**Open(Inactive)**

Video Analytics configuration is activated if the configuration is included in at least one of the profiles.
***Note**! Profile does not need to be activated when configuring video analytics settings.*

User can add/remove rules (maximum of 5 rules are supported per configuration).



Video Anaytics 1

Common

Type: Adaptive Motion Detection

Name: Video Anaytics 1

Usage

Profiles: **Profile 4 - Video 2**

Parameters

Engine Cfg Name: Motion detection 1

Sensitivity: 50 (1...100)

Learning rate: 5 (1...100)

Mask: Edit mask

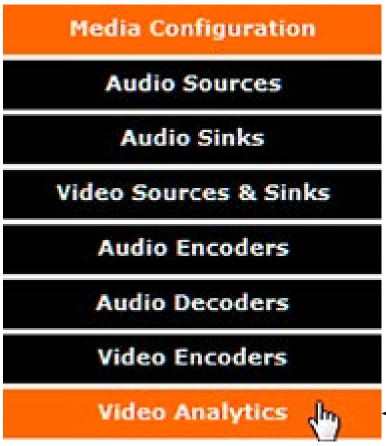
Rules

Type: Motion Detection Threshold

Name: Rule1

Threshold (0%..100%): 10 %

Messages: **RuleEngine/MotionDetection/ThresholdCrossed**



Video analytics configurations

Click “**Video Analytics**” under the Media Configuration menu. **Video Analytics Configurations** page appears on the screen. Video Analytics settings can be configured on this page. All the parameters can be configured dynamically i.e. when video analytics configuration is active.

Common

Type: Adaptive motion detection.

Name: User defined name for video analytics configuration object (max 64 chars).

Usage

Profiles: It shows the media profile which the video analytic is associated with .

Parameters

Engine Cfg Name: User defined name for video analytics engine configuration (max 64 chars).

Sensitivity: Motion detection algorithm sensitivity. Range is 1-100%

Learning time: Motion detection algorithm learning rate.

Mask: When monitoring an area for security, there may be certain parts within the camera’s field of view that need to be kept private. Masking is a feature that enables these areas to be concealed from view.

Rules

Type: Motion detection threshold.

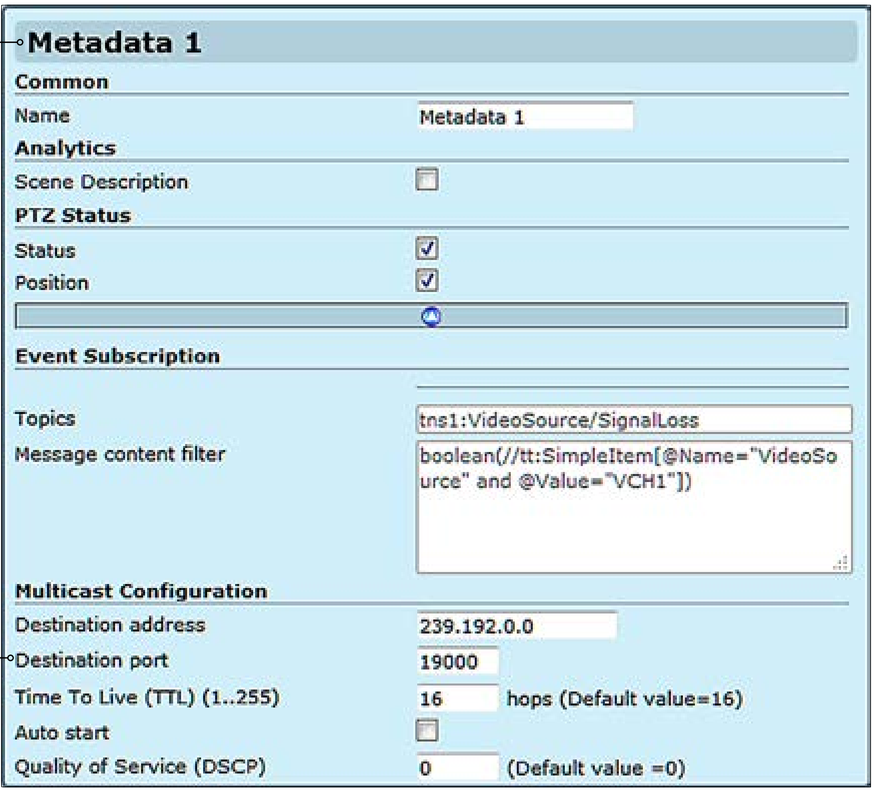
Name: User defined name for rule (max 64 chars).

Threshold (0%..100%): Threshold percentage to trigger rule. Range is 0-100%

Messages:

Metadata is a data channel and one of the Onvif features which can carry events, PTZ status, and/or video analytics data for network video devices.

Note! Only even port numbers can be used for RTP, and then the following odd port number shall be used for RTCP (RFC 1889).



Metadata 1

Common

Name: Metadata 1

Analytics

Scene Description: □

PTZ Status

Status: ☑

Position: ☑

Event Subscription

Topics: tns1:VideoSource/SignalLoss

Message content filter: boolean(//tt:SimpleItem[@Name="VideoSource" and @Value="VCH1"])

Multicast Configuration

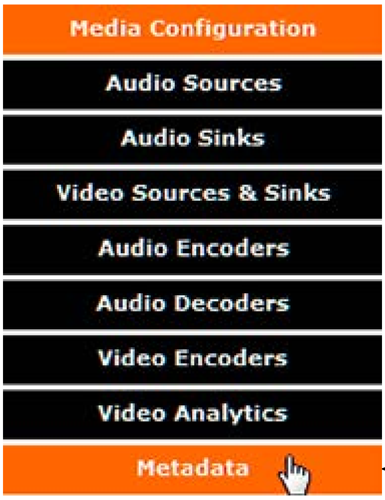
Destination address: 239.192.0.0

Destination port: 19000

Time To Live (TTL) (1..255): 16 hops (Default value=16)

Auto start: □

Quality of Service (DSCP): 0 (Default value =0)



Note! Parameters cannot be changed when streaming is active.

Metadata configurations

Click "**Metadata**" under the Media Configuration menu. **Metadata Configurations** page appears on the screen. You can add a metadata configuration to an existing media profile, adding a metadata configuration to a profile means that streams using that profile contain metadata. Four metadata configurations are supported. In addition to video analytics information, metadata can transmit PTZ camera status and position to the Onvif client. Carrying other events such as "loss of video signal" is done by metadata channel. Metadata transmits video analytics information like motion detection over RTP stream in XML format. Currently MPH transmits motion detection information, PTZ camera status (feedback) and video loss event over metadata channel.

Common

Name: User defined alias name for metadata configuration (max 64 chars).

Analytics

Scene Description: Enable/disable scene description. When enabled, adds video analytics results from each analyzed frame to metadata. With motion detection this includes amount of motion detected and defined threshold level.

PTZ Status

Status: Enable/disable PTZ control status.

Position: Enable/disable PTZ camera position.

Event Subscription Event subscription defines which events are included to metadata stream.

Topics: Event subscription topics.

Message content filter: Event subscription message content filter.

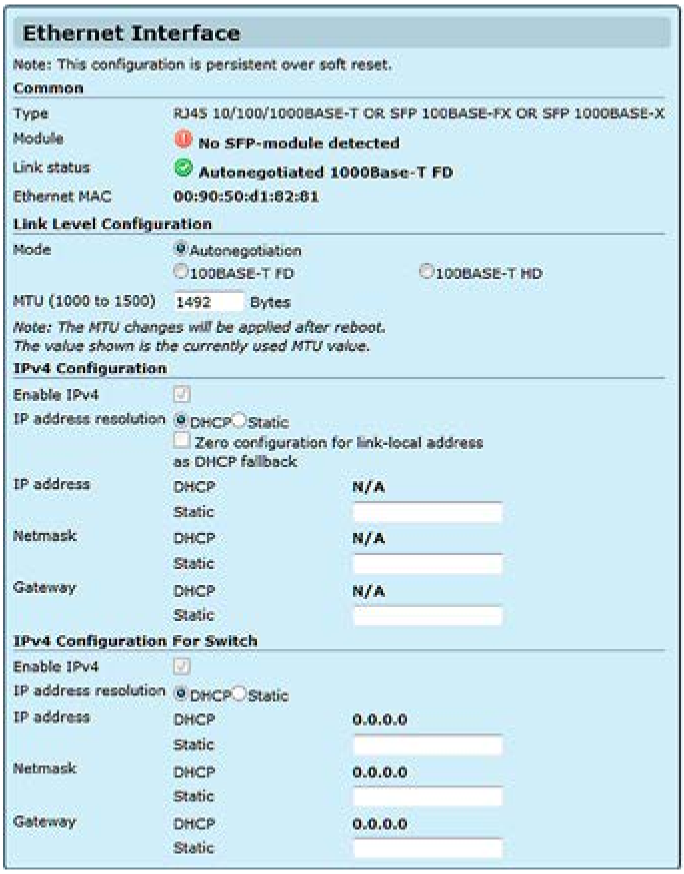
Multicast Configuration

Destination address: You can set a multicast address and port number for a Metadata stream,
Destination port: the multicast address can be the same as video stream multicast address but with different port number.

Time To Live (TTL) (1..255): Multicast Time-To-Live for metadata packets.

Auto start: If enabled, metadata streaming starts automatically after reboot (does not immediately start or stop streams).

Quality of Service (DSCP): Defines QoS class in differentiated services (DiffServ) traffic management. DSCP/DiffServ (Differentiated Services Code Point) is a field in the IP headers that affects the priority of packet in the network per hop basis.



Ethernet Interface

Note: This configuration is persistent over soft reset.

Common

Type	RJ45 10/100/1000BASE-T OR SFP 100BASE-FX OR SFP 1000BASE-X	
Module	**No SFP-module detected**	
Link status	**Autonegotiated 1000Base-T FD**	
Ethernet MAC	**00:90:50:d1:82:81**	

Link Level Configuration

Mode	● Autonegotiation	
	○ 100BASE-T FD	○ 100BASE-T HD
MTU (1000 to 1500)	1492 Bytes	

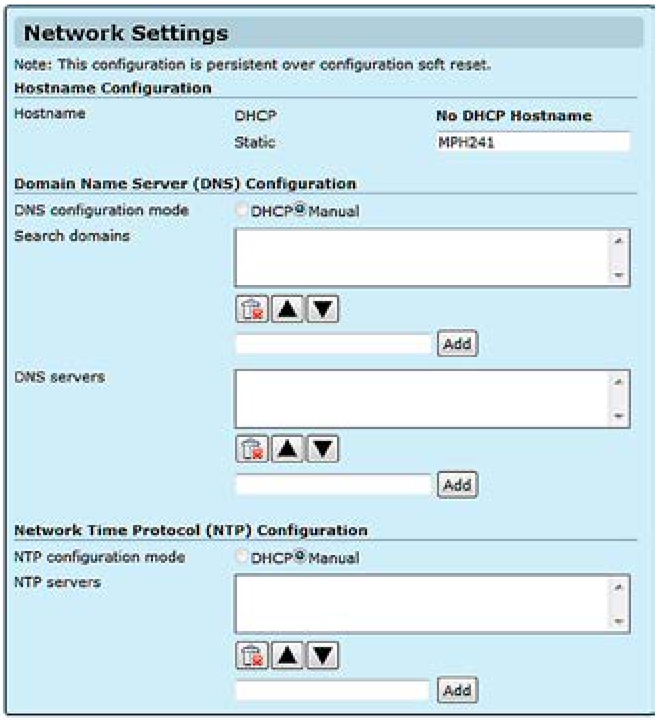
Note: The MTU changes will be applied after reboot.
The value shown is the currently used MTU value.

IPv4 Configuration

Enable IPv4	☑	
IP address resolution	● DHCP ○ Static □ Zero configuration for link-local address as DHCP fallback	
IP address	DHCP	**N/A**
	Static	
Netmask	DHCP	**N/A**
	Static	
Gateway	DHCP	**N/A**
	Static	

IPv4 Configuration For Switch

Enable IPv4	☑	
IP address resolution	● DHCP ○ Static	
IP address	DHCP	**0.0.0.0**
	Static	
Netmask	DHCP	**0.0.0.0**
	Static	
Gateway	DHCP	**0.0.0.0**
	Static	



Network Settings

Note: This configuration is persistent over configuration soft reset.

Hostname Configuration

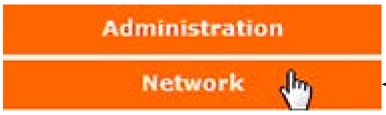
Hostname	DHCP	**No DHCP Hostname**
	Static	MPH241

Domain Name Server (DNS) Configuration

DNS configuration mode	○ DHCP ● Manual
Search domains	Add
DNS servers	Add

Network Time Protocol (NTP) Configuration

NTP configuration mode	○ DHCP ● Manual
NTP servers	Add



Network settings

Click "**Network**" under the Media Configuration menu. Ethernet Interface & **Network Settings** pages appears on the screen. Device's network settings can be changed on thess pages.

Ethernet interface

Common

Type: Device's Ethernet Interface type.

Module: Shows the status of SFP module.

Link status: Shows the current link status and connection type.

Ethernet MAC: MAC address of the device.

Link Level Configuration

Mode: You can select the connection mode, Auto negotiation or fixed rate.

MTU (1000 to 1500): You can adjust he maximum transmission unit based on your connection type, default value is 1492 bytes. The MTU range is from 68 to 1500.

IPv4 Configuration

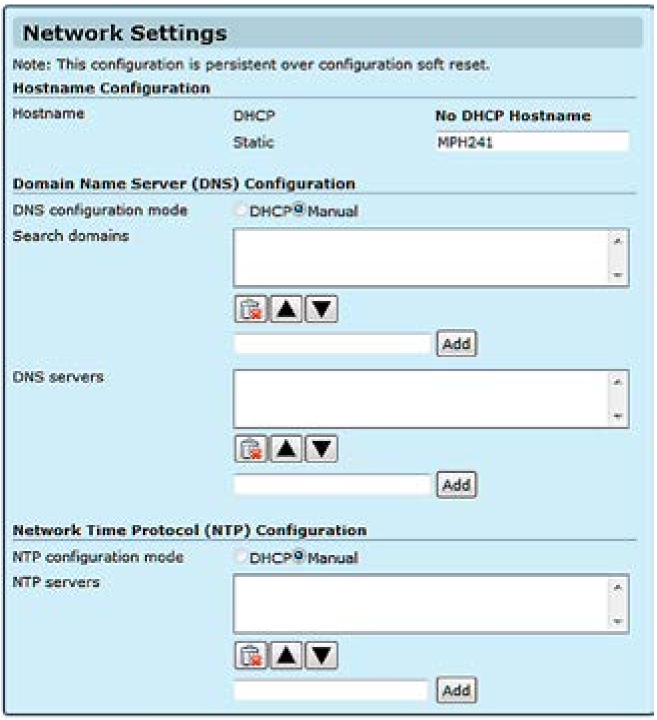
Enable IPv4: IPv4 enabled (change not supported).

IP address resolution: You can set a static IP address for the unit (in case of static IP the user can set IP address, subnet mask and gateway address) or select DHCP mode to obtain IP address automatically. When you enable ZeroConf protocol, the device will set an IP address randomly to itself if it fails to find the DHCP server after few trials.

IP address: IP address of the device.

Netmask: Netmask address of the device.

Gateway: Gateway address for router definition.



Network Settings

Note: This configuration is persistent over configuration soft reset.

Hostname Configuration

Hostname	DHCP	**No DHCP Hostname**
	Static	MPH241

Domain Name Server (DNS) Configuration

DNS configuration mode ○ DHCP ● Manual

Search domains

DNS servers

Network Time Protocol (NTP) Configuration

NTP configuration mode ○ DHCP ● Manual

NTP servers

Network settings

Hostname Configuration

Hostname: User defined hostname for device (max 64 chars). If the DHCP server is configured to assign a hostname to the unit, it will be used, and will be shown here.

> ***Note****! Underline is not allowed, use only marks A...Z, a...z, 0...9 and – (dash)*

Domain Name Server Configuration

If the unit needs to resolve an URL to an IP address by sending a name resolution query, (for instance NTP server given in URL form from DHCP) you need to enter at least one DNS server IP address.

DNS configuration mode: Static Mode or DHCP Mode. In **Static NTP mode** you can set up to 3 NTP servers, change the priority by moving the servers up and down and no needed servers can be deleted. The server on the top of the list has the highest priority and decreases down the list. In **DHCP mode** all controls are disabled and the priority is assigned by the DHCP server.

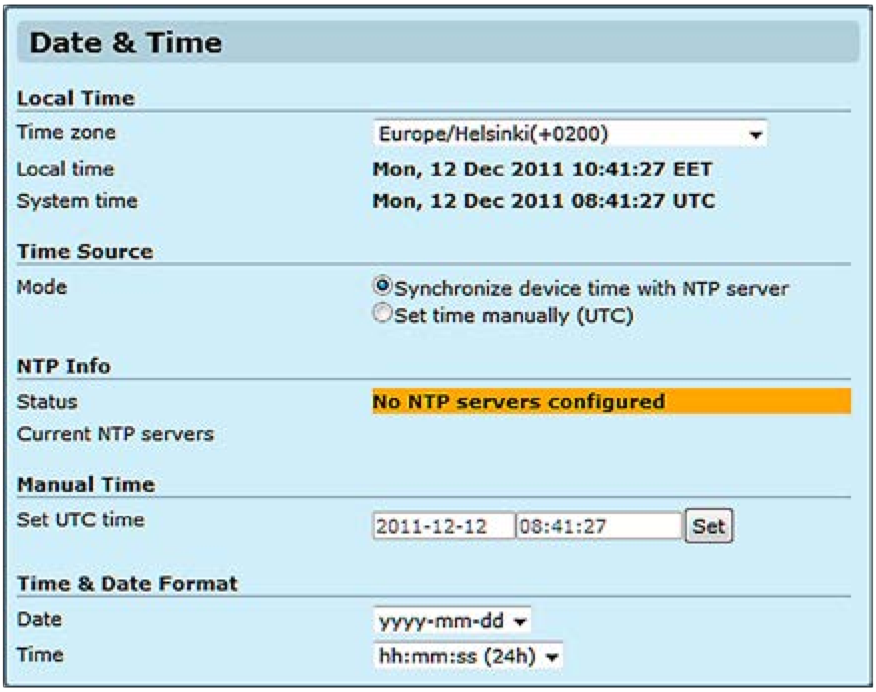
Search domains: Searches the given DNS domain (e.g. teleste.com) for lookup an IP address; you can add up to three domain names. You can change the DNS domains’ priority by moving them up and down. The top of the list has the highest priority.

DNS servers: Sends name resolution query to then given DNS servers, you can add up to three DNS sever. You can change the DNS servers’ priority by moving them up and down. The one on the top of the list has the highest priority.

Network Time Protocol (NTP) Configuration

NTP configuration mode: If you select DHCP server to control DNS and NTP settings, the manually entered DNS and NTP servers will be discarded.

NTP servers: You can add up to three NTP servers for time synchronisation. You can change the NTP servers’ priority by moving them up and down. The one on the top of the list has the highest priority.



Date & Time

Local Time

Time zone	Europe/Helsinki(+0200) ▾
Local time	Mon, 12 Dec 2011 10:41:27 EET
System time	Mon, 12 Dec 2011 08:41:27 UTC

Time Source

Mode	● Synchronize device time with NTP server ○ Set time manually (UTC)

NTP Info

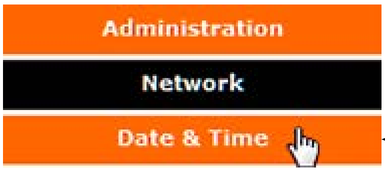
Status	No NTP servers configured
Current NTP servers	

Manual Time

Set UTC time	2011-12-12 08:41:27 Set

Time & Date Format

Date	yyyy-mm-dd ▾
Time	hh:mm:ss (24h) ▾



Date & time settings

Click “**Date & Time**” under the Administration menu. **Date & Time Settings** page appears on the screen. Device’s Date & Time settings can be changed on this page. This page also shows the system time and the local time calculated using the time zone set on the device.

Local Time

Time zone: Selected time zone. Defines how conversion from system time (UTC) to local time is done. For user the local time is shown, for example in video text overlay timestamps. Conversion also takes daylight saving time in to account.

Local time: Shows local time.

System time: Shows system time (allways in GMT).

Time Source

Mode: Source for the clock, either manual or NTP synchronized.

NTP info

Status: NTP status (synchronization OK, No NTP servers configured).

Current NTP servers: Shows configured NTP servers IP address.

Manual time

Set UTC time: Set UTC time manually.

Time & Date Format

Date: Select date format type.

Time: Select time format type.

Notes! *If month is entered as 14, the date will change to February of the next year and if date is entered as 32, the date will change to the 1st of the next month if the number of days in the current month is 31.*

The date and time entered in the boxes has to match the format specified. If the required date is 1st Jan 2011 , it has to be entered as 01/01/2011 and not as 1/1/2011. The latter setting will throw up an error when saved.

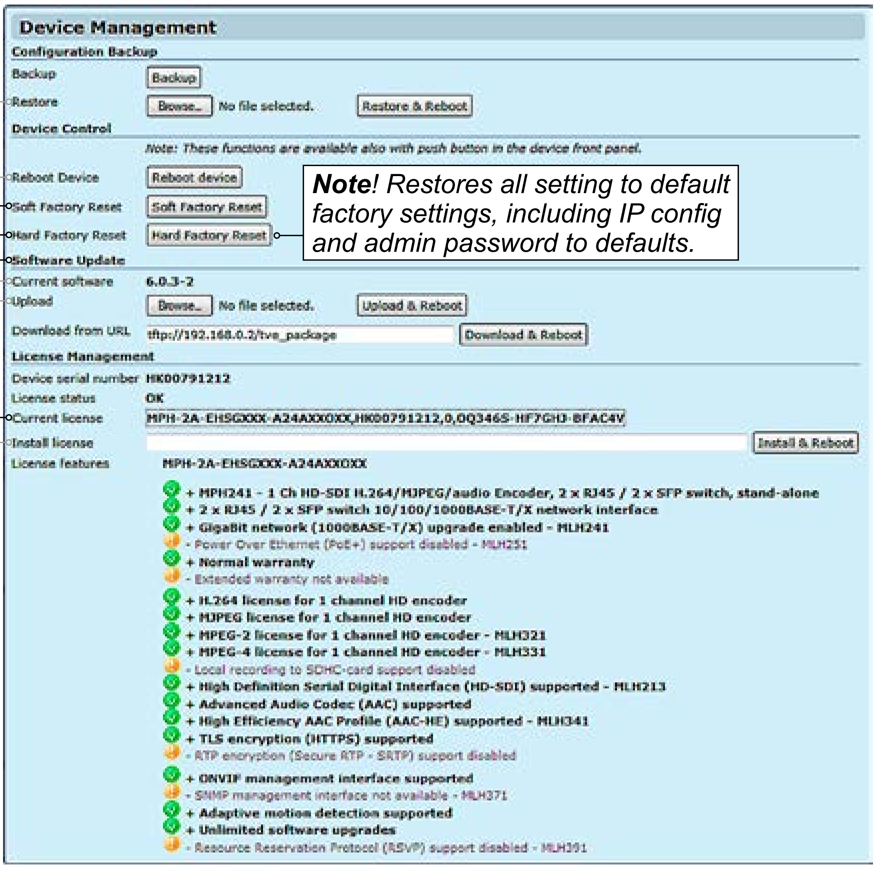
Note! *After device reboots, wait until M-led is green again (wait at least 10 minutes).*

Note! *wait at least 4 min. rebooting.*

Note! *wait at least 15 min. rebooting.*

Note! *After the software has been updated, please clear your browser's cache to ensure the correct operation of WebUI.*

Note! *A new license will replace the old one.*



Device Management

Configuration Backup

Backup [Backup]

Restore [Browse...] No file selected. [Restore & Reboot]

Device Control

Note: These functions are available also with push button in the device front panel.

Reboot Device [Reboot device]

Soft Factory Reset [Soft Factory Reset]

Hard Factory Reset [Hard Factory Reset]

Software Update

Current software 6.0.3-2

Upload [Browse...] No file selected. [Upload & Reboot]

Download from URL tftp://192.168.0.2/tve_package [Download & Reboot]

License Management

Device serial number HK00791212

License status OK

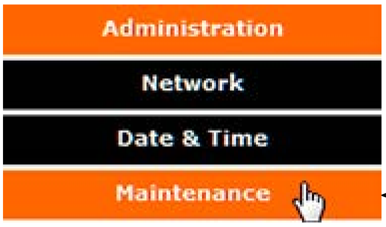
Current license MPH-2A-EHSGXXX-A24AXXOXX,HK00791212,0,OQ346S-HF7GHJ-8FAC4V

Install license [Install & Reboot]

License features MPH-2A-EHSGXXX-A24AXXOXX

- ✓ + MPH241 - 1 Ch HD-SDI H.264/MJPEG/audio Encoder, 2 x RJ45 / 2 x SFP switch, stand-alone
- ✓ + 2 x RJ45 / 2 x SFP switch 10/100/1000BASE-T/X network interface
- ✓ + GigaBit network (1000BASE-T/X) upgrade enabled - MLH241
- ! - Power Over Ethernet (PoE+) support disabled - MLH251
- ✓ + Normal warranty
- ! - Extended warranty not available
- ✓ + H.264 license for 1 channel HD encoder
- ✓ + MJPEG license for 1 channel HD encoder
- ✓ + MPEG-2 license for 1 channel HD encoder - MLH321
- ✓ + MPEG-4 license for 1 channel HD encoder - MLH331
- ! - Local recording to SDHC-card support disabled
- ✓ + High Definition Serial Digital Interface (HD-SDI) supported - MLH213
- ✓ + Advanced Audio Codec (AAC) supported
- ✓ + High Efficiency AAC Profile (AAC-HE) supported - MLH341
- ✓ + TLS encryption (HTTPS) supported
- ! - RTP encryption (Secure RTP - SRTP) support disabled
- ✓ + ONVIF management interface supported
- ! - SNMP management interface not available - MLH371
- ✓ + Adaptive motion detection supported
- ✓ + Unlimited software upgrades
- ! - Resource Reservation Protocol (RSVP) support disabled - MLH391

Note! *Restores all setting to default factory settings, including IP config and admin password to defaults.*



Device management

Click "**Maintenance**" under the Administration menu. **Device Management** page appears on the screen. This page allows you to make configuration backup and restore, reboot the device, apply soft and hard factory resets, update software and install new license key(s).

Configuration Backup

Backup: Click [Backup] to store the current configuration to a file.

Restore: Click [Browse...] to find/select the stored configuration file to the device and then click [Restore & Reboot] to save the configuration file to the device. Device restarts automatically after pressing this button.

Device control

Reboot Device: Click [Reboot device] to restart the device.

Soft Factory Reset: Click [Soft Factory Reset] to make a soft factory reset to the device -> restores all, except IP configuration to the default factory settings.

Hard Factory Reset: Click [Hard Factory Reset] to make a hard factory reset to the device -> restores all settings to default factory settings!

Software update

Current software: Shows device's current firmware version.

Upload: Click [Browse...] to find/select the new firmware file to the device and then click [Upload & Reboot] to upload the firmware file to the device. Device restarts automatically after pressing this button.

Download from URL: Click [Download & Reboot] to upload the new firmware file from user specified server (TFTP, FTP and HTTP) to the device. An example of FTP URL: "tftp://FTP_SERVER_IP/MPH-x-x.x.xx-x.bin". Device restarts automatically after pressing this button.

License management

Device serial number: Shows device serial number.

License status: Shows current licence status.

Current license: Shows device's current licence(s).

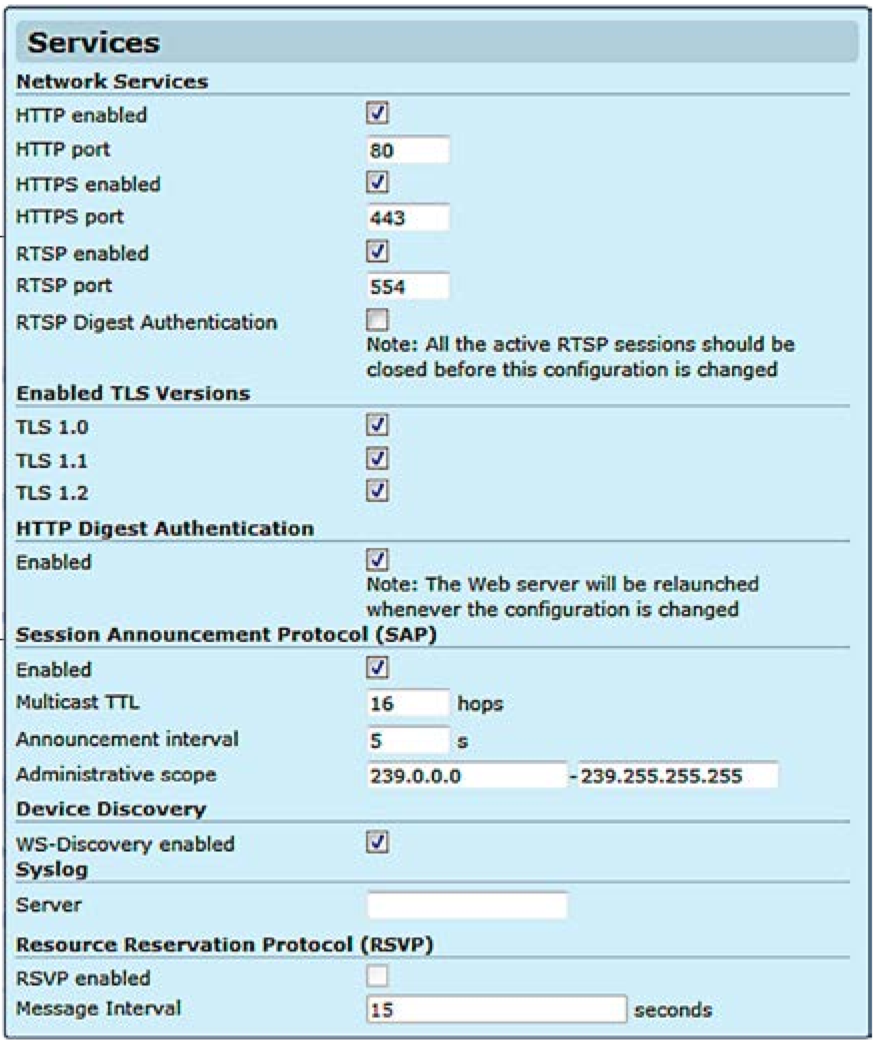
Install license: Copy a licence code here and then click [Install & Reboot] to take the license to use. Device restarts automatically after pressing this button.

License features:

The Real Time Streaming Protocol (**RTSP**) ia a network protocol used to establish and control media sessions between devices. For example, a video Decoder sends RTSP play command to the video Encoder.

***Note**! If port clash is detected while configuring RTSP server port, device gives an error message and disables RTSP server. After that you have to give an unused (valid) port and enable RTSP server again.*

Session Announcement Protocol (SAP) is a protocol for broadcasting multicast session information. A SAP listening application can listen to the SAP multicast IP address and construct a guide of all advertised multicast sessions (RFC 2974). SAP uses Session Description Protocol (SDP) as the format of the session descriptions. Announcement data is sent using IP multicast and UDP.



Services

Network Services

HTTP enabled ☑
HTTP port 80
HTTPS enabled ☑
HTTPS port 443
RTSP enabled ☑
RTSP port 554
RTSP Digest Authentication □
Note: All the active RTSP sessions should be closed before this configuration is changed

Enabled TLS Versions

TLS 1.0 ☑
TLS 1.1 ☑
TLS 1.2 ☑

HTTP Digest Authentication

Enabled ☑
Note: The Web server will be relaunched whenever the configuration is changed

Session Announcement Protocol (SAP)

Enabled ☑
Multicast TTL 16 hops
Announcement interval 5 s
Administrative scope 239.0.0.0 - 239.255.255.255

Device Discovery

WS-Discovery enabled ☑

Syslog

Server

Resource Reservation Protocol (RSVP)

RSVP enabled □
Message Interval 15 seconds

Services settings

Click "**Services**" under the Administration menu. **Services Settings** page appears on the screen. This page allows you to enable/disable different network services available and configure following parameters of services:

Network Services

HTTP enabled: HTTP is always enabled.
HTTP port: Port 80 is used always.
HTTPS enabled: Enable/disable HTTPS.
HTTPS port: Configure HTTPS server port.
RTSP enabled: Enable/disable RTSP (Real time streaming protocol) server.
RTSP port: Configure RTSP server port.

Enabled TLS versions

TLS 1.0: Enable/Disable Transport Layer Security protocol 1.0 (RFC 2246).
TLS 1.1: Enable/Disable Transport Layer Security protocol 1.1 (RFC 4346).
TLS 1.2: Enable/Disable Transport Layer Security protocol 1.2 (RFC 5246).

HTTP Digest Authentication

Enabled: Enable/Disable HTTP digest access authentication (RFC 2069).

***Note!** When is enabled, authentication is mandatory for all profile based JPEG snapshot download.*

Session Announcement Protocol (SAP)

Enabled: Enable/Disable Session Announcement protocol (RFC 2974).
Multicast TTL: Multicast Time-To-Live for SAP packets (1...255).
Announcement interval: SAP timing in seconds (1...999). Retransmit time of SAP-packet. This time has to be same at both encoder and decoder pairs.

Administrative scope: Range of multicast IP addresses advertised with SAP. When the stream multicast address is within the SAP scope, end of the scope is used. Otherwise default SAP-address 224.2.127.254 is used. Default SAP-scope is 239.0.0.0 - 239.255.255.255.

Device Discovery

WS-Discovery enabled: This enables ONVIF device discovery feature.

Simple Network Management Protocol Currently this service is not upported.
(SNMP) Enable/Disable SAP SNMP v2c protocol. Requires licence **MLH371**
SNMP v2c enabled: installation. Activation disables ONVIF.
Specifies the read only community (public or private).
Read community: Specifies the write community (public or private).
Write community: Trap Destination defines the IP address of an agent receiving traps.
Trap destination 1...4:

Syslog Syslog is a standard for computer data logging. By using syslog you can collect messages sent from MPH on the syslog sever.

Server: Shows syslog server IP address. If this field is left blank then remote logging is disabled.

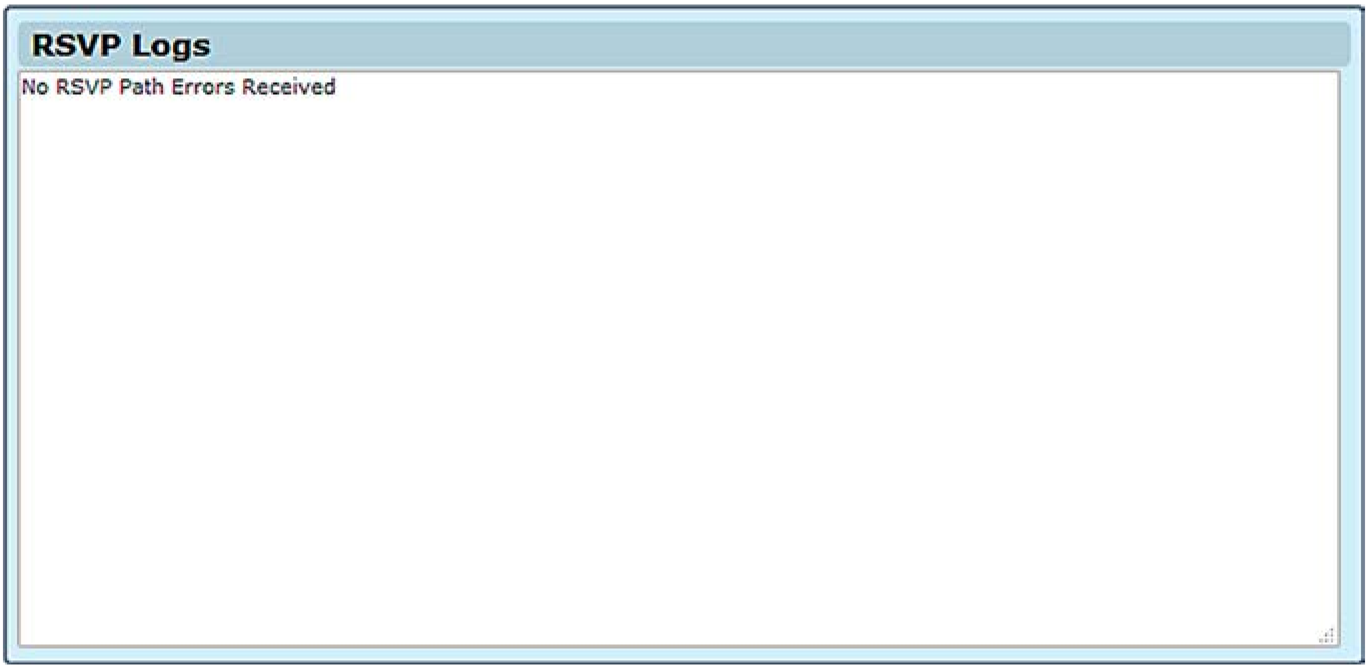
Resource Reservation Protocol (RSVP)

RSVP enabled: This enables RSVP feature (RFC 2205).

Message Interval: Defines RSVP message interval.

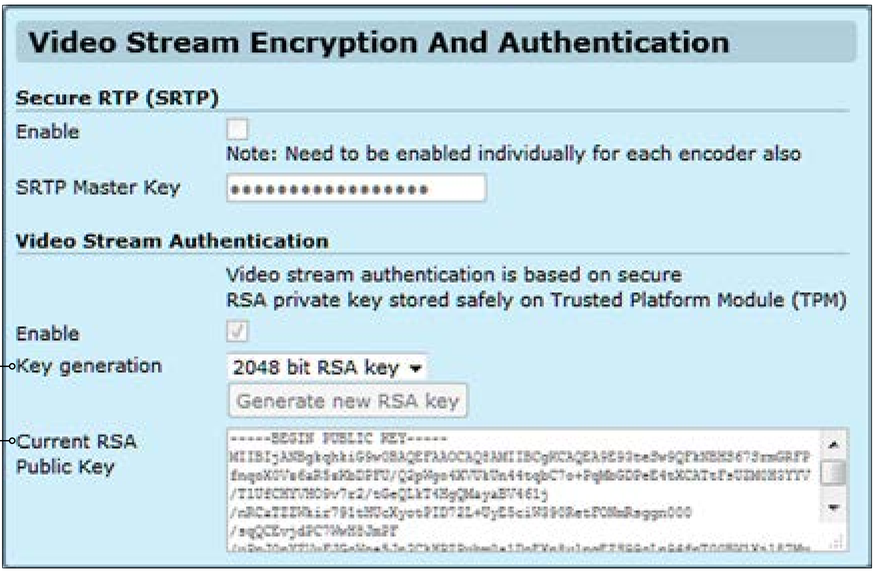
RSVP logs

Shows RSVP Logs.



RSVP Logs

No RSVP Path Errors Received



Video Stream Encryption And Authentication

Secure RTP (SRTP)

Enable □ Note: Need to be enabled individually for each encoder also

SRTP Master Key ••••••••••••••••

Video Stream Authentication

Video stream authentication is based on secure RSA private key stored safely on Trusted Platform Module (TPM)

Enable ☑

Key generation: 2048 bit RSA key ▾

Current RSA Public Key:

```
-----BEGIN PUBLIC KEY-----
MIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA9E93ze3w9QFkNBH567SzmGRFP
fnqoX0Vs6aR5sKbDPFU/Q2pMgo4KVUkUn44tqbC7o+PqMbGDPeE4tXCATtFzUIMOMSYYV
/T1UfCMYVHO9v7r2/sGeQLkT4HgQMayaBV461j
/nRCaTIZWkir791tMUcXyotPID7IL+UyE5ciW890RetFONmRsggn000
/sqQCXvjdPC7WvH8JmPF
```

RSA involves a public key and a private key. The public key can be known to everyone and is used for encrypting messages. Messages encrypted with the public key can only be decrypted using the private key. The public key for the RSA algorithm are generated by MPH key generator and appears in the “Current RSA Public Key” box.

Video stream encryption and authentication

Secure RTP (SRTP) MPH200 series supports video stream encryption and authentication, it adds authentication information to video elementary stream.
It allows verifying the exact encoder has encoded the video stream and video is authentic. Authentication is done by a hardware chip in the device called trusted platform module (TPM). TPM is a hardware chip in devices that securely holds RSA key and generates RSA-signatures by it.
You can have a certification (x509) for TPM RSA key pairs (e.g. signed by Teleste) mapped to the serial number of the MPH encoder, showing that particular device encoded the video. So any recording can be traced back to exact MPH unit.

Enable: Enables/disables SRTP feature.

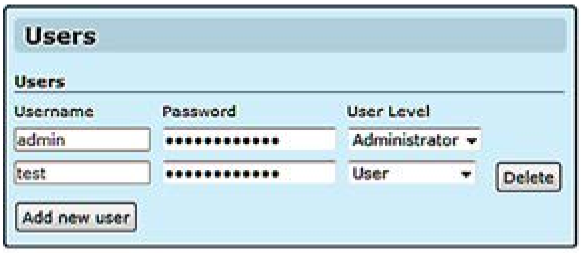
SRTP Master Key: A single “master key” can provide keying material for encryption and integrity protection for both SRTP and SRTCP streams.

Video Stream Authentication Video stream authentication is based on secure RSA private key stored safely on Trusted Platform Module (TPM). SRTP uses 2048bit RSA mode encryption for authentication. RSA delivers a higher level of security strength compared to other algorithms.

Enable: Enables/disables video stream authentication feature.

Key generation: Generates RSA key.

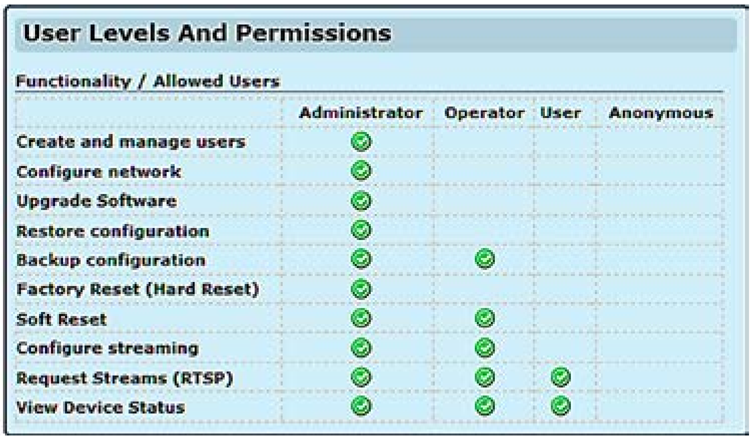
Current RSA Public Key: Shows generated RSA public key.



Users

Users

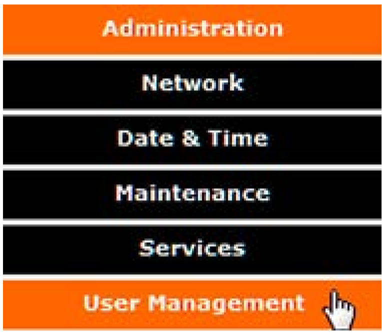
Username	Password	User Level	
admin	●●●●●●●●●●●●	Administrator	
test	●●●●●●●●●●●●	User	Delete



User Levels And Permissions

Functionality / Allowed Users

	Administrator	Operator	User	Anonymous
Create and manage users	✓			
Configure network	✓			
Upgrade Software	✓			
Restore configuration	✓			
Backup configuration	✓	✓		
Factory Reset (Hard Reset)	✓			
Soft Reset	✓	✓		
Configure streaming	✓	✓		
Request Streams (RTSP)	✓	✓	✓	
View Device Status	✓	✓	✓	



User management

Click “**User management**” under the Administration menu. **User management** page appears on the screen. This page allows you modify user settings.

Users

Shows device user accounts. All user accounts are protected by a user name and a password. Administrator user can create and remove user.

Username: Set username for user.

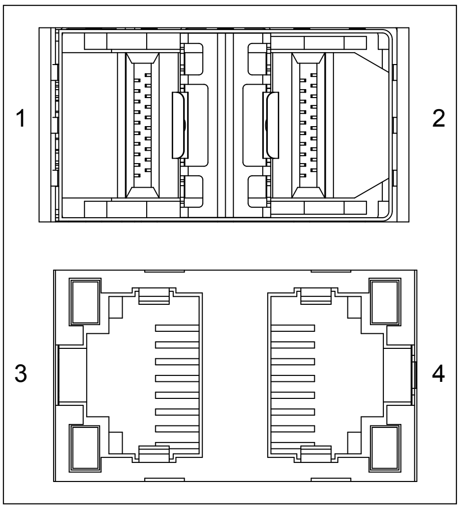
Password: Set password for user.

User Level: Select user level for user.

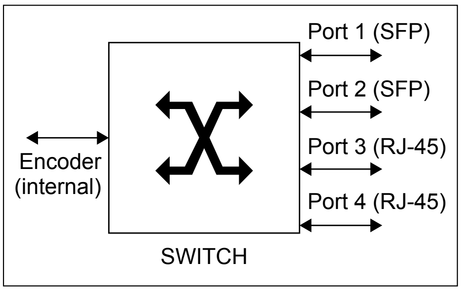
Functionality / Allowed users

Shows permissions for different users.

Configuring ethernet switch



MPH200 has two fixed (3 &4) and two SFP (1 & 2) Ethernet ports.



MPH200 switch's internal connection.

Switch inroduction and features

MPH200 has a built-in four port tri-speed Ethernet Switch with two integrated copper transceivers and two SFP ports. Switch is a fully managed field hardened stand-alone Gigabit Ethernet switch for video networking applications. The product is designed for use in harsh environment applications.

MPH200 Ethernet Switch provides non-blocking wire-speed performance. It can operate as either a VLAN-aware switch or a VLAN-unaware switch. It can forward frames at Layer 2, based on information from layer 2 and layer 3. All memory is included on-chip, because each port has its own shared memory of 20 kilobytes for frame storage. This section gives an overview of the functionality and features of the switch.

MPH200 Ethernet Switch supports IGMP snooping, VLAN, network redundancy, SNMP management, port configuration, port alarms, QoS (layer 2 and 3) and port mirroring. Switch supports both command line interface (CLI) and WEB User Iinterface (WebUI).

Auto-negotiation

MPH200 Ethernet Switch supports twisted pair auto-negotiation, as defined in IEEE Std 802.3-2002 clause 28. The purpose of auto negotiation is to allow a device to advertise modes of operation. The auto negotiation function provides the means to exchange information between two devices that share a point-to-point link segment, and to automatically configure both devices to take maximum advantage of their abilities. Auto negotiation is performed totally within the physical layers during link initiation, without any additional overhead to either the MAC or higher protocol layers. Auto negotiation allows the ports to do the following:

- Advertise their abilities
- Acknowledge receipt and understanding of the common modes of operation that both devices share
- Reject the use of operational modes that are not shared by both devices
- Configure each port for the highest-level operational mode that both ports can support.

Auto MDI/MDI-X function

The device automatically detects whether the cable connected to an RJ-45 port is crossed or straight through, when auto-negotiation is enabled. Standard wiring for end stations is Media-Dependent Interface (MDI) and the standard wiring for hubs and switches is known as Media-Dependent Interface with Crossover (MDIX).

QoS – quality of service

Various classifications and prioritizations are supported in order to enable Quality of Service for real time applications. The switch supports four QoS classes. On each port, an enhanced categorizer assigns priorities based on information taken from Layer 2 and Layer 3.

The categorizer analyzes all received frames. It assigns each frame to one of four QoS classes based on:

1. Port-based priority
2. User priority in the VLAN tag header (IEEE Std 802.1p)
3. Differentiated Services Code Point (DSCP/DiffServ) from the IP-header (IPv4 and IPv6 supported)

Based on the priority assigned by the categorizer, higher priority frames take precedence over lower priority frames during forwarding through the switching engine. In case of congestion, the lowest priority traffic is dropped before higher priority frames. In addition, the higher priority frames are able to overtake the lower priority frames in the queue, thereby minimizing latency for expedited data.

Congestion control

The ingress and egress directions on all ports can be configured to manage network congestion independently, either by dropping frames or by flow control pause frame signalling. Flow control is guaranteed no dropping for frame sizes up to about 4 kilobytes. Asymmetric flow control is supported for both the ingress and egress direction. Software can set up individual high and low thresholds for each FIFO. These thresholds control the starting and stopping of pause signalling. The internal FIFOs have enough memory to handle flow control on short-haul, full-duplex lines without using excessive pause signalling. The switch generates flow control pause frames, when necessary, to ensure that frames are never dropped. In half-duplex mode, flow control is supported through back pressure. In drop mode, the switch handles congestion situations by dropping frames intelligently according to bandwidth allocations, frame priorities, and available buffer capacity. The MPH premium switch features both strict priority-based forwarding and weighted fairness forwarding, with guaranteed bandwidth allocation for the different QoS classes.

MAC address learning

When a frame is received, the source MAC address is looked up in the MAC address table. If the address is not registered, and it is not a multicast address, a new entry is created. If necessary, an entry is discarded to make room for the new one based on a “least recently used” algorithm. MPH200 Ethernet Switch is capable of looking up and adding all incoming entries to the MAC table at maximum load, which is known as “wire-speed learning”.

IP multicast

MPH200 Ethernet Switch provides enhanced support for IP Multicast by allowing up to 8192 programmable multicast groups to co-exist in the MAC table. This, in combination with IGMP snooping enables applications such as digital video distribution.

IGMP snooping

The Internet Group Management Protocol (IGMP) lets host and routers share information about multicast group memberships. IGMP snooping is a switch feature that monitors the exchange of IGMP messages and copies them to the CPU for further processing. The overall purpose of IGMP-snooping is to limit the forwarding of multicast frames to only ports that are a member of the multicast group.

Flooding storm control

MPH200 Ethernet Switch features a flooding control system for constraining undesired behavior caused by, for example, loops in the network or denial-of-service attacks.

SNMP – simple network management protocol

MPH200 Ethernet Switch supports SNMPv2c. SNMP enables network administrators and control engineers to manage network performance, find and solve network problems, and plan for network growth. One feature of SNMP is that the SNMP agent (in this case a MPH200 switch) can send SNMP traps to one or more SNMP Hosts. SNMP traps mean system alarms such as a port link loss or a port enabled for port alarms or the switch temperature exceeding a predefined threshold.

Flow control

Flow control can be enabled or disabled on a per-port basis from the command line interface or from the WEB interface. If flow control is enabled for a port the associated PHY will be set to advertise support of “Symmetric Pause”, but not “Asymmetric Pause”. If the station connected to the port also supports “Symmetric Pause”, flow control will be enabled on the switch port. Watermarks are set to hard-coded values. Different values are used depending on whether flow control is enabled or not and on current speed.

Ageing

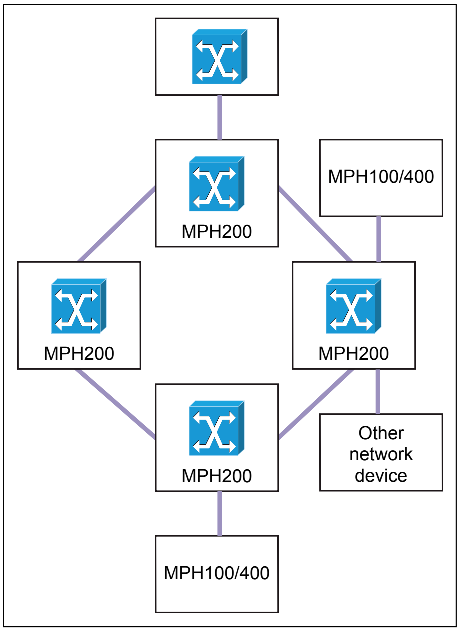
To prevent that an automatically learned MAC address of a station that has been detached will remain in the MAC address table permanently, the ageing function in the switch is activated on a regular basis. The period for doing the ageing function is determined by the ageing time parameter. Given the ageing mechanism in the switch, the period must be half the value of the ageing time parameter in order to make the ageing time parameter comply with IEEE 802.1D. For instance, if the ageing time parameter is 300 seconds, the period must be 150 seconds to ensure that an unused MAC address will not remain in the MAC address table for more than 300 seconds.The ageing time parameter can be set from the command line interface. Default value is 300 seconds. Setting the ageing time parameter to 0 disables the ageing function.

VLAN support

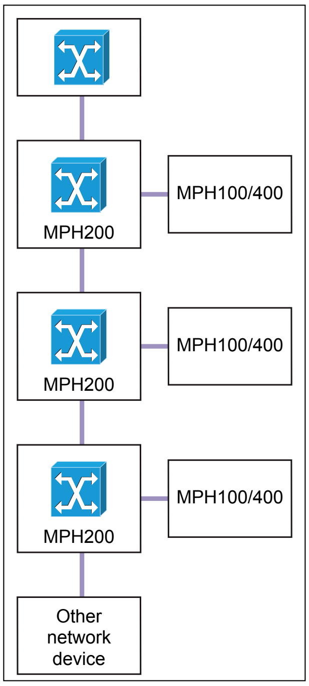
VLANs are collections of switching ports that comprise a single broadcast domain. Packets are classified as belonging to a VLAN based on either the VLAN tag or based on a combination of the ingress port and packet contents. Packets sharing common attributes can be grouped in the same VLAN.

STP – spanning tree protocol

802.1d Spanning tree is a standard Layer 2 switch requirement that allows bridges to automatically prevent and resolve L2 forwarding loops. Switches exchange configuration messages using specifically formatted frames and selectively enable and disable forwarding on ports.



Redundant ring with MPH200 encoders.



Chaining with MPH200 encoders.

RSTP – rapid spanning tree protocol

Spanning Tree can take 30...60 seconds for each host to decide whether its ports are actively forwarding traffic. Rapid Spanning Tree (RSTP) detects uses of network topologies to enable faster convergence, without creating forwarding loops.

Port mirroring

Port mirroring monitors and mirrors network traffic by forwarding copies of incoming and outgoing packets from a monitored port to a monitoring port. Users specify which target port receives copies of all traffic passing through a specified source port.

Link aggregation (trunking)

MPH200 Ethernet Switch supports ingress and egress port aggregation in accordance with IEEE Std 802.3ad. Any number of ports can be aggregated into any number of groups. Frames are distributed among the aggregated ports by an advanced frame distribution function, which, through configuration, can use the following information:

- Source and destination MAC addresses
- Source and destination IP addresses
- TCP/UDP port numbers for IPv4 packets
- Flow label for IPv6 packet
- Pseudo-randomization.

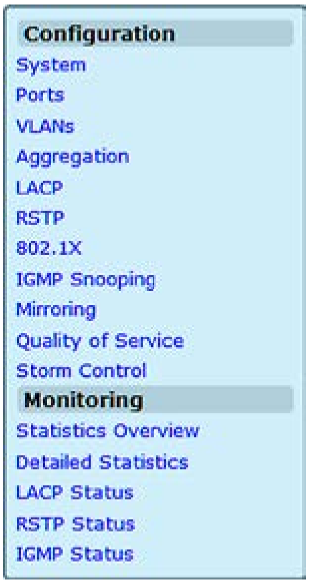
LACP – link aggregation control protocol

LACP uses peer exchanges across links to determine, on an ongoing basis, the aggregation capability of various links, and continuously provides the maximum level of aggregation capability achievable between a given pair of systems. LACP automatically determines, configures, binds and monitors the port binding within the system.

802.1X – port-based network access control

The port-based network access standard IEEE Std 802.1X provides a framework to implement port authentication where only authenticated ports have access to the network. Ports are initially in an unauthorized state where normal frame forwarding for the port is disabled. The port only accepts special authentication frames. Upon authorization, the network services become enabled for the port, and normal frame forwarding is possible. The authentication is initiated by extensible authentication protocol over LAN (EAPOL) frames, which are identified by the unique bridge group address 01-80-C2-00-00-03.

Web user interface



You can manage the switch via Web User Interface (WebUI). Following options are available:

Configuration

- Set port speed
- Configure simple port-based VLAN
- Enable/disable flow control
- Storm Control Configuration
- Configure RSTP parameters
- Configure QoS
- Configure and monitor IGMP snooping

Monitoring

- Read and clear port statistics
- Monitor LACP status
- Monitor RSTP status
- Monitor IGMP status

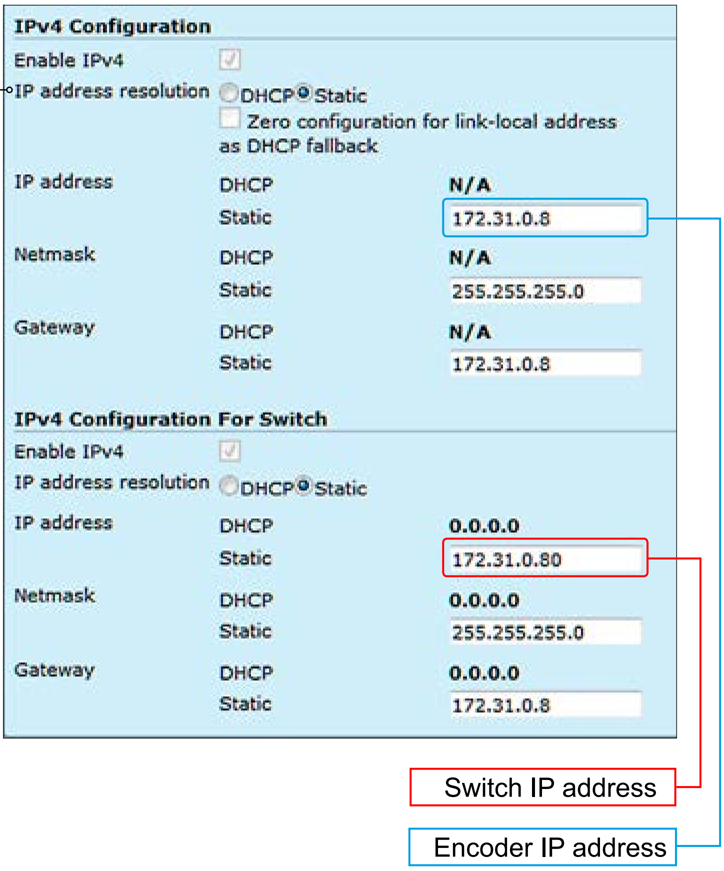
How to access the Ethernet Switch

In order to access the Ethernet switch you need to assign an IP address to the switch from encoder WebUI. By default both encoder and ethernet switch IP addresses are assigned automatically from DHCP server. The IP address should be in the same IP range as encoder is set.

To assign the static IP address, click “**Network**” under the Administration menu. **NETWORK SETTINGS** page appears on the screen. In the “**IPv4 Configuration For Switch**” session you can set the IP address, netmask and gateway address.

The default setting is **DHCP** enabled.

● DHCP ○ Static



IPv4 Configuration

Enable IPv4 ☑

IP address resolution ○ DHCP ● Static

□ Zero configuration for link-local address as DHCP fallback

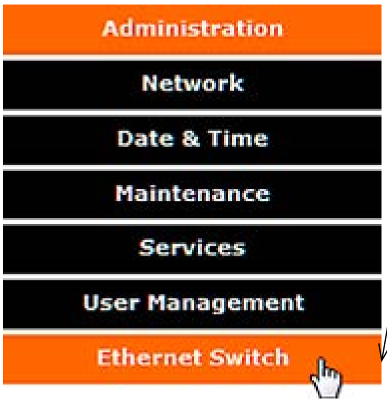
IP address	DHCP	N/A
	Static	172.31.0.8
Netmask	DHCP	N/A
	Static	255.255.255.0
Gateway	DHCP	N/A
	Static	172.31.0.8

IPv4 Configuration For Switch

Enable IPv4 ☑

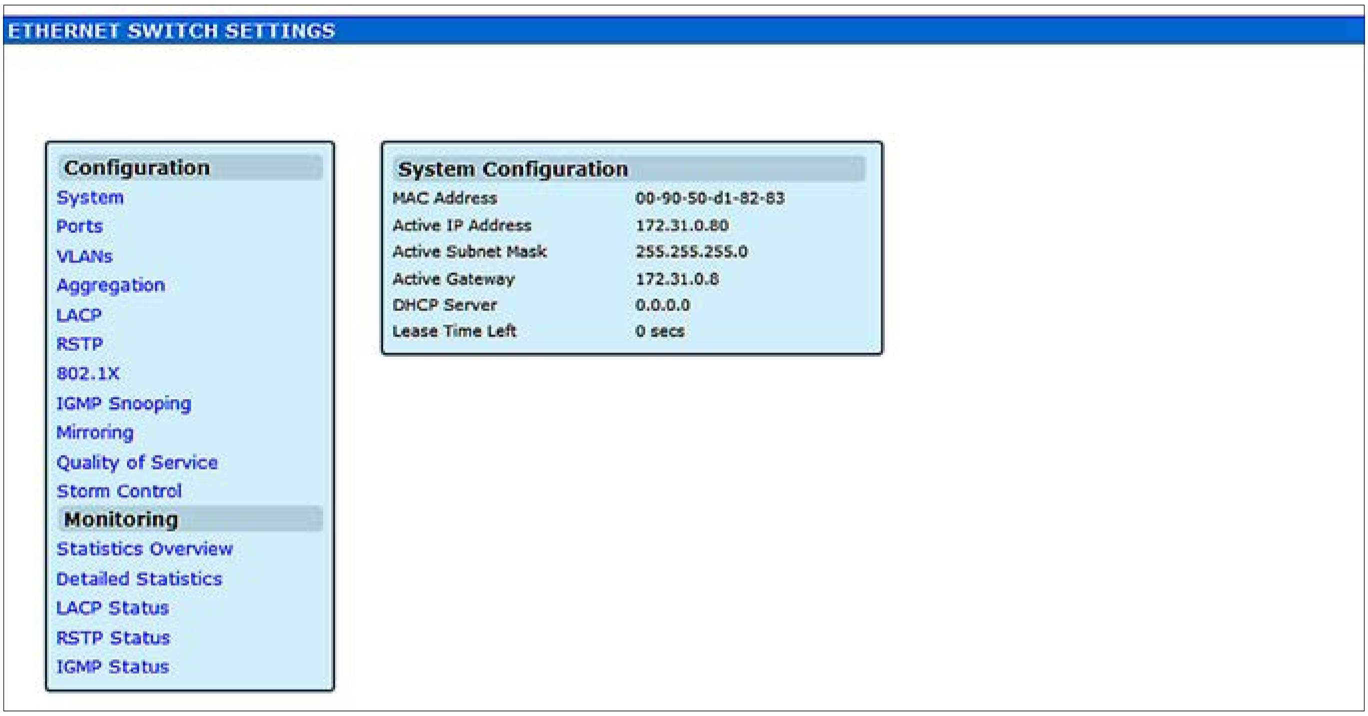
IP address resolution ○ DHCP ● Static

IP address	DHCP	0.0.0.0
	Static	172.31.0.80
Netmask	DHCP	0.0.0.0
	Static	255.255.255.0
Gateway	DHCP	0.0.0.0
	Static	172.31.0.8



Ethernet switch settings

Click “**Ethernet Switch**” under the Administration menu.
ETHERNET SWITCH SETTINGS / System Configuration page appears on the screen.



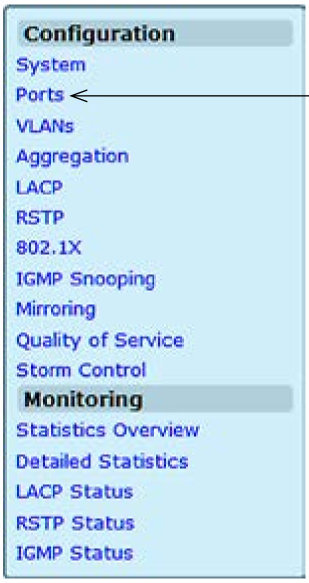
ETHERNET SWITCH SETTINGS

Configuration
System
Ports
VLANs
Aggregation
LACP
RSTP
802.1X
IGMP Snooping
Mirroring
Quality of Service
Storm Control
Monitoring
Statistics Overview
Detailed Statistics
LACP Status
RSTP Status
IGMP Status

System Configuration	
MAC Address	00-90-50-d1-82-83
Active IP Address	172.31.0.80
Active Subnet Mask	255.255.255.0
Active Gateway	172.31.0.8
DHCP Server	0.0.0.0
Lease Time Left	0 secs

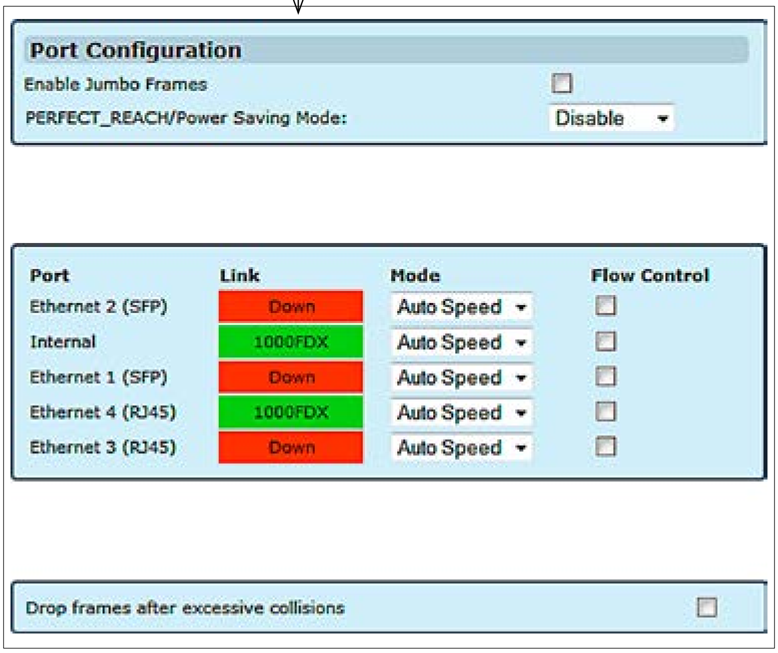
System configuration

Mac address: Device mac address
Active IP Address: Valid IP address
Active Subnet Mask: Valid subnet mask
Active Gateway: Valid gateway address
DHCP Server: Netmask address for subnet definition
Lease Time Left: The time how long the DHCP server will lease the IP address to the device using it



Ports

Click “**Ports**” under the Configuration menu. **Port Configuration** page appears on the screen.



Port Configuration

Enable Jumbo Frames	□
PERFECT_REACH/Power Saving Mode:	Disable

Port	Link	Mode	Flow Control
Ethernet 2 (SFP)	Down	Auto Speed	□
Internal	1000FDX	Auto Speed	□
Ethernet 1 (SFP)	Down	Auto Speed	□
Ethernet 4 (RJ45)	1000FDX	Auto Speed	□
Ethernet 3 (RJ45)	Down	Auto Speed	□

Drop frames after excessive collisions □

Port configuration

Enable Jumbo Frames: Allows you to enable Jumbo (giant) frames which are bigger than the standard frame size (1518 bytes of payload).

PERFECT_REACH/Power Saving Mode: PerfectReach is an intelligent algorithm, it detects the presence of a shorter cable and then adaptively lowers the power level, saving energy for links shorter than the full 100 meters of cable length specified by IEEE standards.

Drop frames after excessive collisions: Allows the switch to drop the frame if it has exceeded the maximum of 16 retransmissions in the collision mechanism.

Virtual LANs (VLANs) – introduction

VLANs are logical partitions of the physical LAN. VLANs are collections of switching ports that comprise a single broadcast domain. Packets are classified as belonging to a VLAN based on either the VLAN tag or based on a combination of the ingress port and packet contents. Packets sharing common attributes can be grouped in the same VLAN.

You can use VLANs to:

- Increase network performance
- Increase internal network security
- Create separate broadcast domains

If the network has adequate performance and security for your current needs, it is recommended that you leave the VLAN settings in the default configuration. The default configuration is as follows:

- All ports are members of VLAN 1
- The switch management interface is on VLAN 1 (this cannot be changed)
- All ports have a Port VLAN ID (PVID) of 1
- All ports can send and receive both VLAN-tagged and untagged packets (i.e. they are “hybrid” ports)

In the default configuration, any port is able to send traffic to any other port and a PC connected to any port will be able to reach the management interface. Broadcast traffic, for example, will be flooded to all ports on the switch.

VLAN page lets you to configure VLANs per port. The switch can be configured as either VLAN unaware, behaving transparently toward VLAN- tagged frames, or as VLAN aware, where VLAN information is used in the forwarding decision. The switch can maintain 16 VLANs.

For a VLAN-aware (enabled) switch, untagged frames are classified to a port specific, configurable VLAN identifier (PVID). Frames that already have a VLAN tag when they are received, they will be classified to the VID within the tag header in the frame.

VLAN-awareness (tagging or untagging frames) can be configured on a per-port basis. Each port can be configured to a set of ports to which it can forward and thereby facilitate port-based VLANs. By defaults, all ports can forward to all other ports.

Packet type

PCs should be connected to ports with Packet Type set to All. PCs cannot, in general, send or receive tagged packets. Switches should be connected to each other with Packet Type set to Tagged.

If the Packet Type is set to All, the port can accept incoming tagged and untagged packets. Untagged packets will be associated with the VLAN identified by the PVID. Tagged packets will be dropped unless the port is a member of the VLAN identified by the VLAN tag in the packet. Outgoing packets will be tagged unless the packet’s VLAN ID is the same as the PVID.

If the Packet Type is set to Tagged, the port will drop untagged packets and will only send and receive tagged packets. Tagged packets will be dropped unless the port is a member of the VLAN identified by the VLAN tag in the packet. The PVID has no effect in this case.

Ingress VLAN classification

The switch always classifies incoming frames to a VLAN. In the VLAN-unaware mode, this classification does not influence the forwarding of the frame, whereas in the VLAN-aware mode, then classification is used to make forwarding decisions. If VLAN tags are available in a frame, the VLAN classification is always based on the outer tag in the frame.

Egress VLAN handling

The switch egress port decides which frames to transmit tagged and which frames to transmit untagged. The following shows how the tagging or untagging is performed at the egress port:

Do not tag frames: This applies when switch is running as VLAN-unaware mode or when the port is VLAN-aware but configured as an access port.
Tag all frames: This applies when the port is configured as a trunk port.
Tag all frames except those with a specific VID: This applies when the port configured as hybrid port, frames with a specific VID won’t be tagged.

VLAN IDs

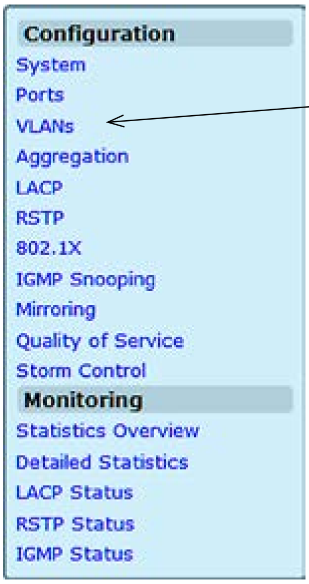
VLAN ID number can be any number from 2 to 3290, or from 3293 to 4094. (VLAN ID 1 is reserved for the default VLAN, which is used for untagged frames received on the interface. VLAN IDs 3291...3292 are reserved and cannot be used.) To create a VLAN, enter the ID number and click Add VLAN.

- VLAN 1 is a special VLAN; it cannot be deleted and, if there is a possibility that a port could become isolated, the Web User Interface will add the port to VLAN 1.
- You can add up to 16 VLANs to the configuration of the switch. Each VLAN must be given a VLAN ID in the range 1...4094.
- A port can be a member of up to 16 VLANs.
- All packets travelling through the switch are associated with one and only one VLAN.
- If a port is not a member of a VLAN, it cannot send or receive packets associated with that VLAN.
- A tagged packet carries its VLAN ID in the payload of the packet.
- An untagged packet, received on a port with Packet Type set to All, is associated with the VLAN identified by the PVID.

Port VLAN ID – PVID

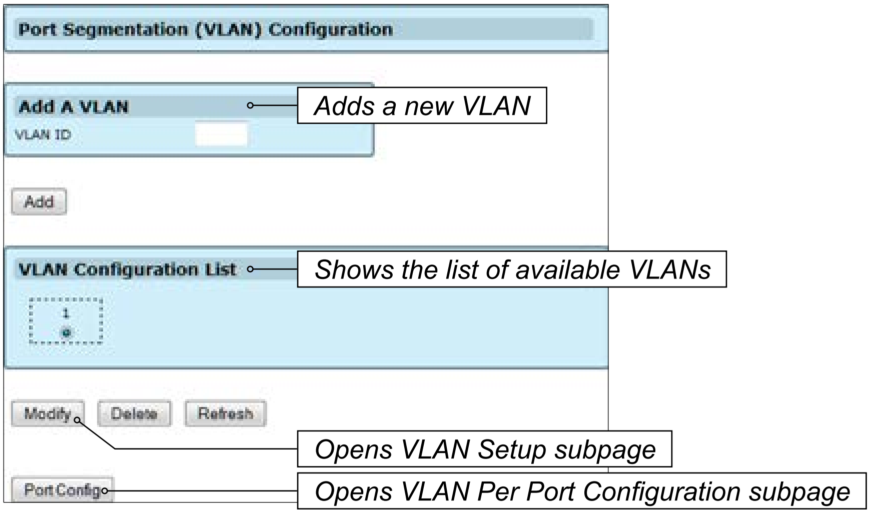
PVID is the VLAN ID that is associated with untagged, ingress packets.
It is not possible to remove a port from VLAN 1 unless its PVID has been changed to something other than 1.

Outgoing packets are tagged unless the packet’s VLAN ID is the same as the PVID. When the PVID is set to “None,” all outgoing pacekts are tagged (trunk port).



VLANs configuration

Click “**VLANs**” under the Configuration menu. **Port Segmentation (VLAN) Configuration** page appears on the screen.



Adds a new VLAN

Shows the list of available VLANs

Opens VLAN Setup subpage

Opens VLAN Per Port Configuration subpage

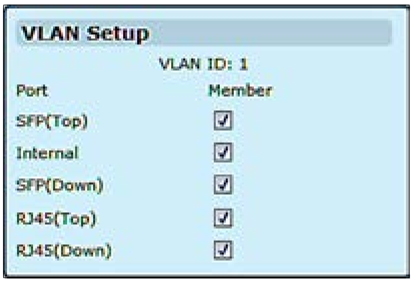
Port segmentation (VLAN) configuration

VLAN ID: Sets VLAN ID (identification of the VLAN).

VLAN Configuration List: Adds the VLAN specified in the VLAN ID field to the VLAN Configuration list.

VLAN setup

Click “**Modify**” button on the VLANs page. **VLAN Setup** page appears on the screen.



VLAN Setup

VLAN ID: 1

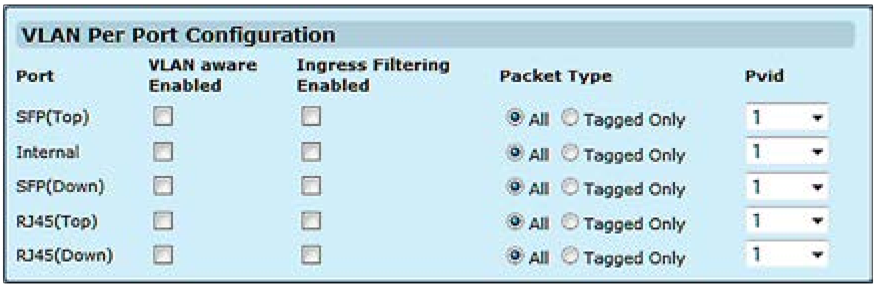
Port	Member
SFP(Top)	☑
Internal	☑
SFP(Down)	☑
RJ45(Top)	☑
RJ45(Down)	☑

Port: Shows available ports.

Member: Adds the VLAN specified in the VLAN ID field to the VLAN Configuration list.

VLAN per port configuration

Click “**Port Config**” button on the VLANs page. **VLAN Per Port Configuration** page appears on the screen. This page allows you to configure the VLAN parameters for individual ports.



VLAN Per Port Configuration

Port	VLAN aware Enabled	Ingress Filtering Enabled	Packet Type	Pvid
SFP(Top)	□	□	● All ○ Tagged Only	1
Internal	□	□	● All ○ Tagged Only	1
SFP(Down)	□	□	● All ○ Tagged Only	1
RJ45(Top)	□	□	● All ○ Tagged Only	1
RJ45(Down)	□	□	● All ○ Tagged Only	1

VLAN aware Enabled: VLAN aware ports are able to use VLAN tagged frames to determine the destination of the frame. Click to enable or disable VLAN awareness mode for this port. (Default: Disabled).

Ingress Filtering Enabled: If enabled, incoming frames for VLANs which do not include this ingress port as a member will be discarded. (Default: Disabled).

Packet Type: Set a port’s handling of tagged and untagged packets. (Default: All).

Pvid: Set the Port VLAN ID. (Default: 1).

Aggregation – introduction

Link aggregation (trunking) allows any number of ports to be grouped together automatically using Link Aggregation Control Protocol (LACP), or manually, to form an ultra-high-bandwidth connection to the network backbone, which helps prevent traffic bottlenecks. MPH200 Ethernet Switch supports LACP.

Link aggregation (IEEE Std 802.3ad) describes a way of aggregating multiple links together to form what appears to be a single link. The goals are to increase bandwidth and to reduce the risk of link failures. Link aggregation groups can be defined statically.

The system provides up to four link aggregated groups. Aggregated links may be defined, each with up to four member ports, to form a single link aggregated group. Link aggregated groups provide:

- Fault tolerance protection from physical link disruption
- Higher bandwidth connections
- Improved bandwidth granularity
- High bandwidth server connectivity
- Link aggregated group is composed of ports with the same speed, set to full-duplex operation.

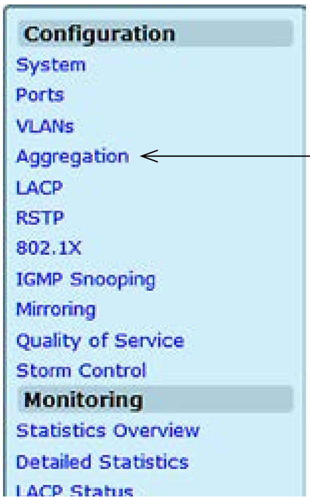
The software will automatically detect that a link has gone down and then reassign packet distribution on the other links in the group.

MPH200 Ethernet Switch supports ingress and egress port aggregation in accordance with IEEE Std 802.3ad. Any number of ports can be aggregated into any number of groups. Frames are distributed among the aggregated ports by an advanced frame distribution function, which, through configuration, can use the following information:

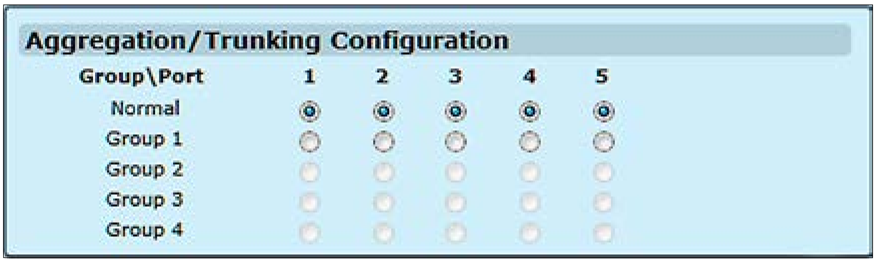
- Source and destination MAC addresses
- Source and destination IP addresses
- TCP/UDP port numbers for IPv4 packets
- Flow label for IPv6 packet
- Pseudo-randomization

> ***Note**! If port mirroring is enabled and mirrors frames to a port in an aggregation group, all mirrored frames go to the mirror port without reflecting the other ports in the aggregation group.*

Aggregation configuration



Click “**Aggregation**” menu under the configuration heading. **Aggregation/Trunking Configuration** page appears on the screen.



Aggregation/Trunking Configuration

Group\Port	1	2	3	4	5
Normal	●	●	●	●	●
Group 1	○	○	○	○	○
Group 2	○	○	○	○	○
Group 3	○	○	○	○	○
Group 4	○	○	○	○	○

Group \ Port: Ethernet port number.
Normal / Group1-4: Click the tick-box of the port you would like to add to the link aggregation groups (LAGs).

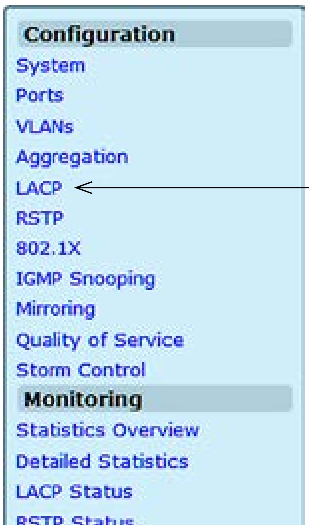
LACP – introduction

Link Aggregation Control Protocol (LACP) is part of the IEEE specification 802.3ad. LACP configured ports can automatically negotiate a trunked link with LACP-configured ports on another device. You can configure any number of ports on the switch as LACP, as long as they are not already configured as part of a static trunk. If ports on another device are also configured as LACP, the switch and the other device will negotiate a trunk link between them.

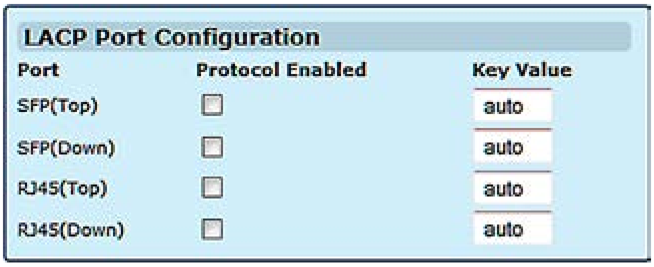
A Gigabit Ethernet port channel balances the traffic load across the links by reducing part of the binary pattern formed from the addresses in the frame to a numerical value that selects one of the links in the channel. Bundled ports equally inherit the logical MAC addresses on the port channel interface.

LACP supports the automatic creation of Gigabit Ethernet port channels by exchanging LACP packets between ports. It learns the capabilities of port groups dynamically and informs the other ports. Once LACP identifies correctly matched Ethernet links, it facilitates grouping the links into a Gigabit Ethernet port channel.

LACP configuration



Click “**LACP**” menu under the configuration heading. **LACP Port Configuration** page appears on the screen.



LACP Port Configuration

Port	Protocol Enabled	Key Value
SFP(Top)	□	auto
SFP(Down)	□	auto
RJ45(Top)	□	auto
RJ45(Down)	□	auto

Protocol Enabled: Allows LACP to be enabled or disabled. When the box is checked, Key
Key Value: Value (0..255, 0 means auto-generated key). Used to determine the link aggregation group membership, and to identify this device to other switches during negotiations.

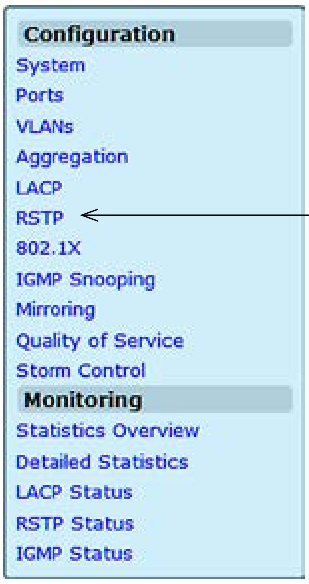
Spanning tree (STP/RSTP) – introduction

The Spanning Tree Algorithm (STA) can be used to detect and avoid network loops, and to provide backup links between switches, bridges or routers. This allows the switch to interact with other bridging devices (that is, an STA-compliant switch, bridge or router) in your network to ensure that only one route exists between any two stations on the network, and provide backup links which automatically take over when a primary link goes down.

The spanning tree algorithms supported by this switch include these versions:

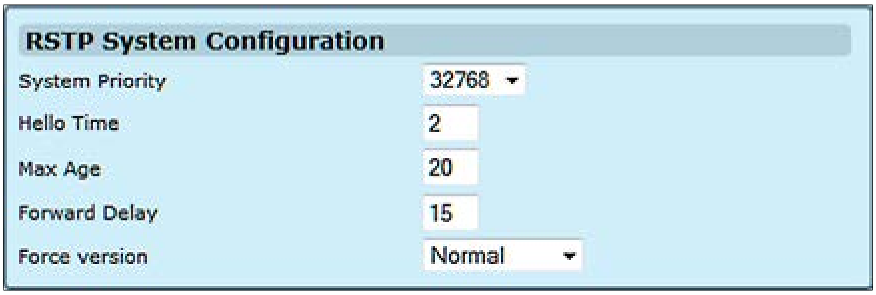
- **STP** – Spanning Tree Protocol (IEEE 802.1D).
  STP is a standard Layer 2 switch requirement that allows bridges to automatically prevent and resolve L2 forwarding loops. Switches exchange configuration messages using specifically formatted frames and selectively enable and disable forwarding on ports.
- **RSTP** – Rapid Spanning Tree Protocol (IEEE 802.1w).
  RTP can take 30-60 seconds for each host to decide whether its ports are actively forwarding traffic. Rapid Spanning Tree (RSTP) detects network topologies to achive faster convergence, without creating forwarding loops.

RSTP configuration



Click “**RSTP**” under the Configuration menu. **RSTP System Configuration** page appears on the screen. The page is composed of two tables:

- **RSTP System Configuration** - Configure global system settings.
- **RSTP Port Configuration** - Setup port related settings.



RSTP System Configuration

System Priority	32768
Hello Time	2
Max Age	20
Forward Delay	15
Force version	Normal

System Priority: This parameter configures the spanning tree priority globally for this switch. The device with the highest priority becomes the STA root device. However, if all devices have the same priority, the device with the lowest MAC address will then become the root device. Number between 0...61440 in increments of 4096. Therefore, there are 16 distinct values.

Hello Time: Interval (in seconds) at which the root device transmits a configuration message (BPDU frame). Number between 1...10 (default is 2).

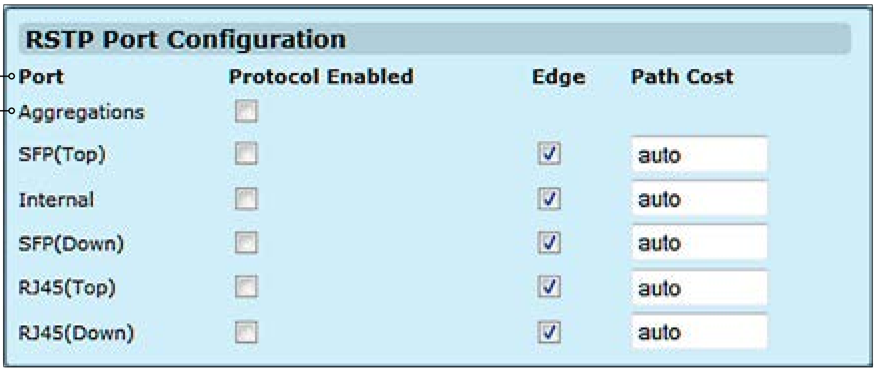
Max Age: The maximum time (in seconds) a device can wait without receiving a configuration message before attempting to reconfigure. That also means the maximum life time for a BPDU frame. Number between 6...40 (default is 20).

Forward Delay: The maximum time (in seconds) the root device will wait before changing states (i.e., discarding to learning to forwarding). Number between 4...30 (default is 15).

Force version: Set and show the RSTP protocol to use.
Normal = use RSTP,
Compatible = compatible with STP.

The port ID. It cannot be changed.

Aggregations means any configured trunk group



RSTP Port Configuration

Port	Protocol Enabled	Edge	Path Cost
Aggregations	□		
SFP(Top)	□	☑	auto
Internal	□	☑	auto
SFP(Down)	□	☑	auto
RJ45(Top)	□	☑	auto
RJ45(Down)	□	☑	auto

Protocol Enabled: Click on the tick-box to enable/disable the RSTP protocol for the port.

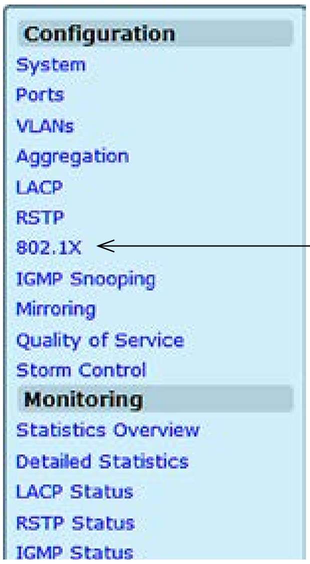
Edge: Expect the port to be an edge port (linking to an end station) or a link to another STP device.

Path Cost: This parameter is used by the STP to determine the best path between devices. Therefore, lower values should be assigned to ports attached to faster media, and higher values assigned to ports with slower media. Set the RSTP pathcost on the port. Number between 0...200000000.

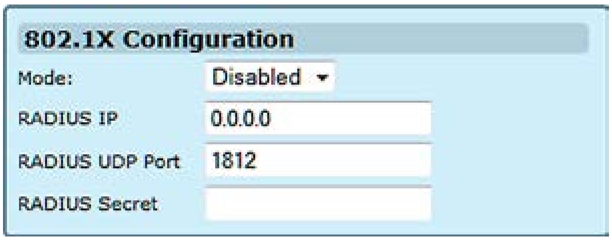
802.1X – introduction

The 802.1X (IEEE 802.1X) standard defines a port-based access control procedure that prevents unauthorized access to a network by requiring users to first submit credentials for authentication.

802.1X configuration



Click “**802.1X**” under the Configuration menu. **802.1X Configuration** page appears on the screen.



802.1X Configuration

Mode: Disabled

RADIUS IP 0.0.0.0

RADIUS UDP Port 1812

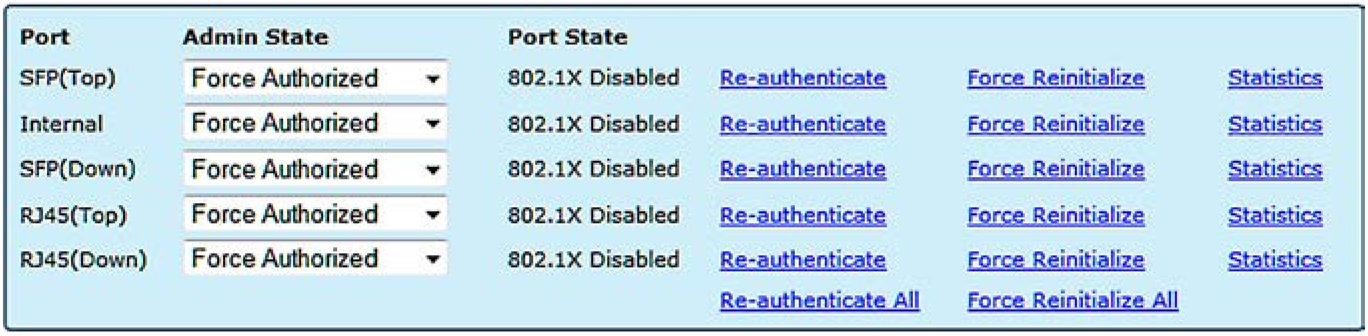
RADIUS Secret

Mode: Indicates if 802.1X protocol is globally enabled or disabled on the switch.

RADIUS IP: Sets the RADIUS server IP address.

RADIUS UDP Port: Sets the UDP port to the use for the external RADIUS server.

RADIUS Secret: Sets the text string used for encryption between the switch and the RADIUS server.



Port	Admin State	Port State			
SFP(Top)	Force Authorized	802.1X Disabled	Re-authenticate	Force Reinitialize	Statistics
Internal	Force Authorized	802.1X Disabled	Re-authenticate	Force Reinitialize	Statistics
SFP(Down)	Force Authorized	802.1X Disabled	Re-authenticate	Force Reinitialize	Statistics
RJ45(Top)	Force Authorized	802.1X Disabled	Re-authenticate	Force Reinitialize	Statistics
RJ45(Down)	Force Authorized	802.1X Disabled	Re-authenticate	Force Reinitialize	Statistics
			Re-authenticate All	Force Reinitialize All	

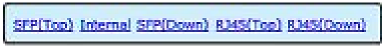
Port: The port number.

Admin State: Sets the authentication mode to one of the following options:
Auto: Requires a 802.1X-aware client to be authorized by the authentication server. Clients that are not 802.1X-aware will be denied access.
Force-Authorized: Forces the port to grant access to all clients, either 802.1X-aware or otherwise.
Force-Unauthorized: Forces the port to deny access to all clients, either 802.1X-aware or otherwise.

Port State: The state of the port.
Re-Authenticate: Schedules a reauthentication to whenever the quiet-period of the port runs out.
Force-Reinitialize: Bypasses the quiet-period of the port and enables immediate reauthentication regardless of the status for the quiet-period.

Statistics: Displays 802.1X statistics. Statistics can be viewed on a per-port basis.

Select the port that you want to view:



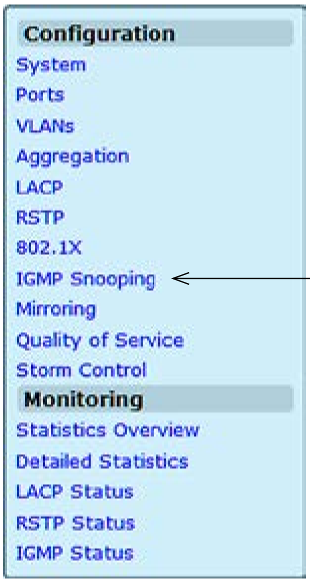
SFP(Top) Internal SFP(Down) RJ45(Top) RJ45(Down)

Authenticator counters: General statistics for authenticator.
Backend Authenticator counters: General statistics for RADIUS server.
802.1X MIB counters: MIB module defined for 802.1X.

IGMP – introduction

The Internet Group Management Protocol (IGMP) lets host and routers share information about multicast group memberships. IGMP snooping monitors IGMP service requests passing between multicast clients and servers, and dynamically configures the ports which need to receive the mulitcast traffic.

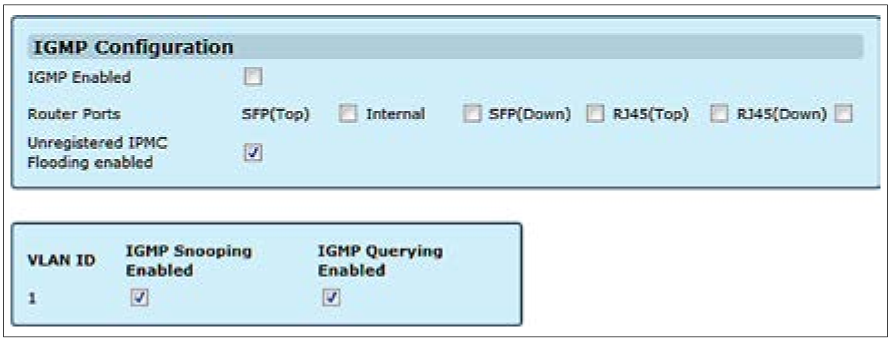
MPH200 Ethernet Switch provides enhanced support for IP Multicast by allowing up to 8192 programmable multicast groups to co-exist in the MAC table. This, in combination with IGMP snooping where IPMC membership information is passed on to the CPU, enables applications such as digital video distribution. Source specific multicast (SSM) is not supported.



IGMP configuration

Click "**IGMP Snooping**" under the Configuration menu. **IGMP Configuration** page appears on the screen. This page enables customers to setup the configuration of IGMP. The page is composed of two tables:

- **IGMP Snooping Configuration** – Configure global system settings
- **IGMP Snooping VLAN Configuration** – Configure VLAN related settings



IGMP Configuration

IGMP Enabled	□
Router Ports	SFP(Top) □ Internal □ SFP(Down) □ RJ45(Top) □ RJ45(Down) □
Unregistered IPMC Flooding enabled	☑

VLAN ID	IGMP Snooping Enabled	IGMP Querying Enabled
1	☑	☑

IGMP Enabled: Enables/disables IGMP support on the switch. When enabled, the switch will monitor network traffic to determine which hosts want to receive multicast traffic.

Router Ports: Enable Router Port if it is leading towards the IGMP querier (switch or router having IGMP querying function enabled).

Unregistered IPMC Flooding enabled: Enabling this will make the switch flood the unregistered (not joined) multicast to all ports and disabling will make the switch forward unregistered multicast traffic to the router ports only.

VLAN ID: The VLAN ID. It can not be changed.

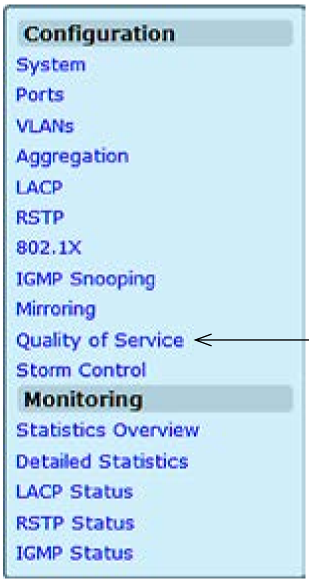
IGMP Snooping Enabled: Enables/disables IGMP snooping on a VLAN. When enabled, the port will monitor network traffic to determine which hosts want to receive the multicast traffic.

IGMP Querying Enabled: Enables/disables IGMP querier on the VLAN. When enabled, the port can serve as the Querier, which is responsible for asking hosts if they want to receive multicast traffic.

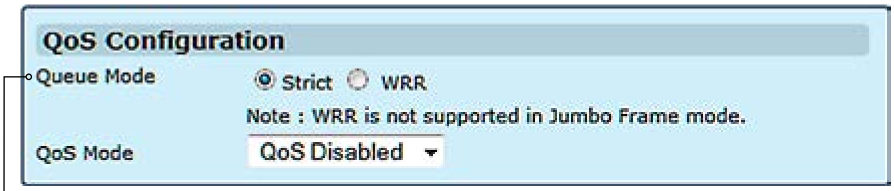
Quality of service (QoS) – introduction

QoS configuration enables the switch to use resources more efficiently to ensure high-quality performance for critical applications. QoS is a mechanism which is used to prioritize certain traffic as it is moves through the switch. Traffic can be classified as High, Medium, Normal or Low priority. This switch features both strict priority-based and weighted round-robin (WRR) forwarding, with guaranteed bandwidth allocation for the different QOS classes.

QoS configuration



Click “**Quality of Service**” under the Configuration menu. **QoS Configuration** page appears on the screen.



QoS Configuration

Queue Mode ● Strict ○ WRR

Note : WRR is not supported in Jumbo Frame mode.

QoS Mode QoS Disabled

Queue Mode: The Queue Mode can be selected by ticking the radio button:
Strict: Higher priority frames take precedence over lower priority frames during forwarding. In case of congestion, the lowest priority traffic is dropped before higher priority frames. Head-of-queue blocking maybe encountered by using this mode.
WRR: In this mode, all priorities can be guaranteed a share of the bandwidth when the system is overloaded. The bandwidth sharing percentage can be adjusted by specifying the four QOS class with different ratio in WRR Weight, which appears after WRR is enabled in Queue Mode.

Note! WRR is selectable only when Jumbo Frame is disabled in Ports / Settings.

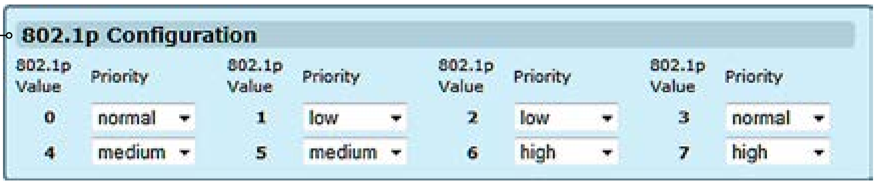
QoS Mode: The QoS Mode can be selected using the QoS Mode drop-down list:
QoS Disabled: QoS is turned off and all packets have equal priority.
802.1p: Packets are prioritzed using the content of the VLAN-tag.
DSCP/DiffServ : Packets are prioritized using the DSCP/DiffServ (Differentiated Services Code Point) value.

***Note**: Only one QoS mode can be active at one time. It is not possible, for example, to prioritise traffic using the DSCP/DiffServ and 802.1p.*

802.1p configuration

The 802.1p field is held within the VLAN-tag of a packet. The field is three bits long so can hold eight values; 0...7 inclusive. When QoS Mode is set to 802.1p, the 802.1p Configuration table appears which allows a priority to be set for each of the eight values.

When QoS Mode is set to 802.1p, the 802.1p Configuration table appears which allows a priority to be set for each of the eight values.



802.1p Configuration

802.1p Value	Priority	802.1p Value	Priority	802.1p Value	Priority	802.1p Value	Priority
0	normal	1	low	2	low	3	normal
4	medium	5	medium	6	high	7	high

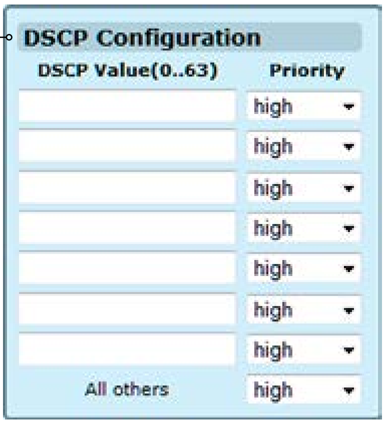
You can use the Priority drop-down list to quickly set the values in the 802.1p Configuration table. Select **Low** to set all values to low priority, **Normal** to set all values to normal priority, **Medium** to set all values to medium priority, or select **High** to set all values to high priority. Use Custom if you want to set each value individually.

> ***Note**: Because end-stations, like PCs, are not usually VLAN aware, they do not create VLAN-tagged frames. As a result, this method of prioritization is not ideal when there are a lot of PCs connected to the switch.*

DSCP configuration

DSCP (DiffServ/Differentiated Services Code Point) is a six bit field that is contained within an IP (TCP or UDP) header. Six bits allows the DSCP field to take any value in the range 0...63 inclusive. When QoS Mode is set to DSCP, the DSCP/DiffServ Configuration table appears which allows a priority to be set for each of the DSCP values.

When QoS Mode is set to DSCP/ DiffServ, the DSCP Configuration table appears which allows a priority to be set for each of the DSCP/DiffServ values.



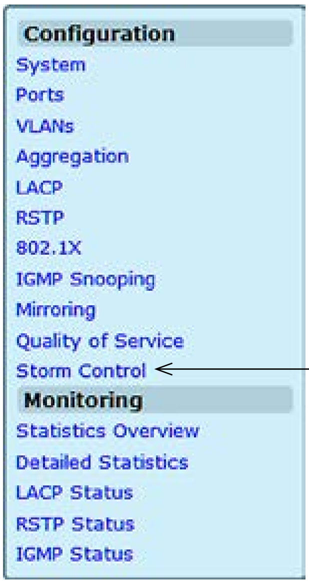
DSCP Configuration

DSCP Value(0..63)	Priority
	high
	high
	high
	high
	high
	high
	high
All others	high

You can use the Priority drop-down list to quickly set the values in the DSCP Configuration table. Select **Low** to set all values to low priority, **Normal** to set all values to normal priority, **Medium** to set all values to medium priority, or select **High** to set all values to high priority. Use Custom if you want to set each value individually.

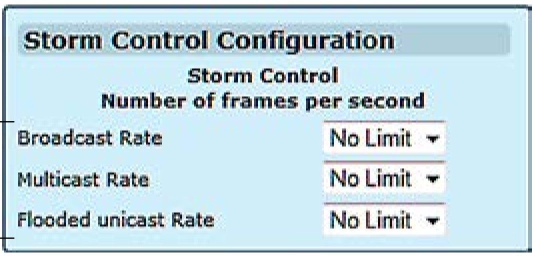
Storm control – introduction

This page allows you to set up a threshold for incoming broadcast and multicast packets. Too many incoming packets can severely cripple the switch and network performance. Rate limiting protects the switch and network by keeping the amount of data passing through the ports to a safe limit. The use of VLANs and Trunks to partition ports and network devices into separate groups can also keep the network from unnecessary traffic by restricting the packet destination. The same setting is applied to all the ports on the switch.



Storm control configuration

Click "**Storm Control**" under the Configuration menu. **Storm Control Configuration** page appears on the screen.



Storm Control Configuration

Storm Control
Number of frames per second

Broadcast Rate	No Limit
Multicast Rate	No Limit
Flooded unicast Rate	No Limit

Type of traffic which can be rate limited

List the type of traffic which can be rate limited, including Broadcast, Multicast and Flooded unicast frames.

The Rate field is set by a single drop-down list. The same threshold is applied to every port on the switch. When the threshold is exceeded, packets are dropped, irrespective of the flow-control settings.

Command line interface - CLI

General

The **MPH** series video encoder unit includes a command line interface (**CLI**) for configuration purposes. The CLI is a screen interface that allows the user to interact with the operating system by entering commands and optional arguments.

The **MPH** supports CLI over UART (RS-232), Telnet and SSH.

CLI is accessed through any terminal emulator application. The command structure is the same for all session types.

> ***Note**! **PuTTY** is a free and open source terminal emulator application which can act as a client for the SSH, Telnet, rlogin, and raw TCP computing protocols and as a serial console client. **Tera Term** has comparable features to PuTTY. **Hyper Terminal** is not included in Windows Vista or later.*

The CLI can be accessed in the following ways:

- Serial data connection (RS232), via **Data 2** port, with a serial connection cable.
- TCP/IP connection, via active **Ethernet** port.

System requirements for CLI

Connection through Data 1 port locally (**UART**):

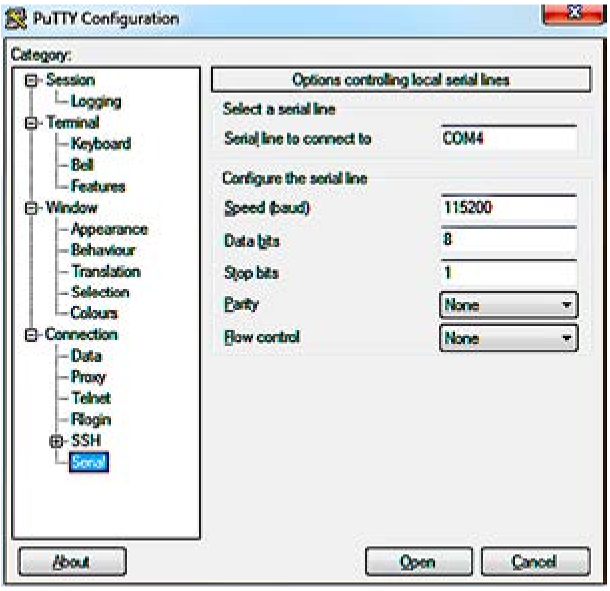
* PC equipped with terminal emulator application supporting **VT100** / **102** or **ANSI** protocols, e.g. Hyper Terminal, **PuTTY** or **Tera Term**.
* **RS232**-cable (type Teleste **CIC506**)

Connection through Ethernet port remotely (**Telnet/SSH**):

* PC equipped with terminal emulator application supporting Secure Shell (SSH) network protocol, e.g. **PuTTY** or **Tera Term**.
* **Ethernet**-connection

Setting	Value
Emulation	VT100, VT102 or ANSI
Protocol	RS232 (serial)
Baud rate	115 200 kbps
Data bits	8
Parity	None
Stop bits	1
Flow control	None

Port settings to local serial (RS-232) connection.



Options controlling local serial lines

Select a serial line

Serial line to connect to: COM4

Configure the serial line

Speed (baud): 115200

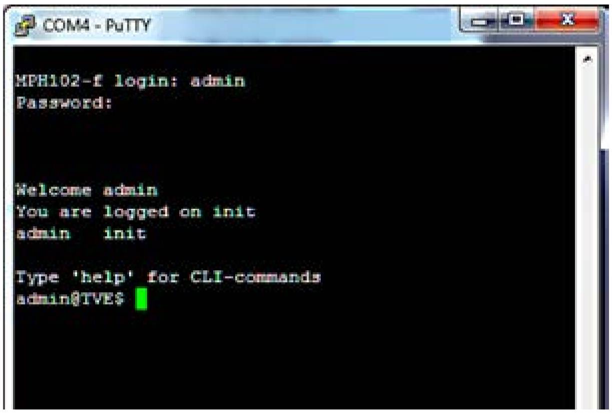
Data bits: 8

Stop bits: 1

Parity: None

Flow control: None

Serial (COM port) settings in Putty.



```
MPH102-f login: admin
Password:


Welcome admin
You are logged on init
admin   init

Type 'help' for CLI-commands
admin@TVE$
```

COM port settings in Putty.

Connection methods - local serial connection

This chapter describes how to connect to CLI locally (via serial cable) using Putty terminal emulator application.

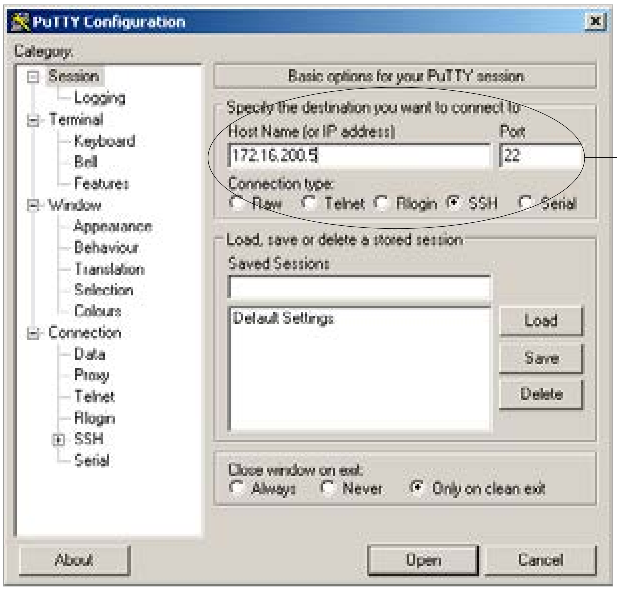
1. Start the Putty terminal emulator application. Wait until the following “**Putty Configuration**” window appears on the screen.
2. Select **Serial** category to continue. The following “**Options controlling local serial lines**” window appears on the screen.
3. Choose **COM** port where the **serial (RS232)** cable is connected, e.g. **COM4** port and then set here the values as described in table beside. Click Open to continue. The blank “**COM4 - PuTTY**” window appears on the screen.
4. To activate the terminal connection first press Enter --> “`MPH241-f login:`” appears on the screen (MPH name depends on device in question).
5. Enter the required user name and the password (admin/admin for administrator). The **MPH** Hyper Terminal window appears on the screen. The terminal connection to **MPH** series video encoder device is now completed and you can now use the CLI commands to management the device.

The terminal connection can be terminated by selecting File/Exit, Alt+F4 or clicking x on the right upper corner of Hyper Terminal window.

Connection methods - TCP/IP

This chapter describes how to connect to CLI via TCP/IP connection using Putty terminal emulator application. The same menus that are displayed on a local terminal are instantly available over an IP network.

1. Start the **PuTTY** application. Wait until the following “**PuTTY Configuration**” window appears on the screen:



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): 172.16.200.5

Port: 22

Connection type: ○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Load, save or delete a stored session

Saved Sessions

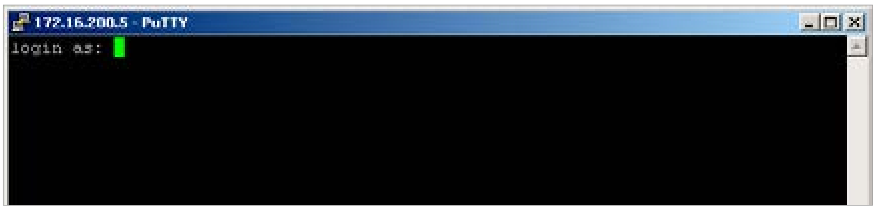
Default Settings

Close window on exit: ○ Always ○ Never ● Only on clean exit

Required settings:
IP address:
Device IP address
Port: 22
Connection type: SSH

PuTTY application view (Windows XP).

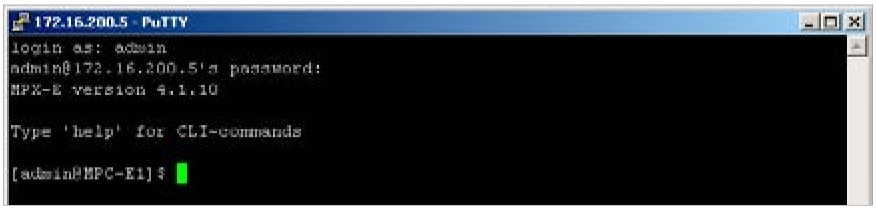
2. Enter the device IP address into the “Host Name (or IP address)” address bar and click Open to continue.
The following “**PuTTY**” window appears on the screen:



```
172.16.200.5 - PuTTY
login as:
```

Telnet program view.

3. Enter the required user name and the password. The following “**172.16.200.5 - PuTTY**” window appears on the screen:



```
172.16.200.5 - PuTTY
login as: admin
admin@172.16.200.5's password:
MPX-E version 4.1.10

Type 'help' for CLI-commands

[admin@MPC-E1]$
```

The **CLI** connection to **MPH** series video encoder is now completed and you can now use the **CLI** commands to management the device.
The **CLI** connection can be terminated by entering command **exit**.

Detailed descriptions of CLI commands

CLI lets you enter several commands. To execute a command, press enter after typing command. By entering “**Help**” command you get a list of all available commands. To get more information about how to use a specific command you can enter “Help + specific command”.
Ctrl+C is the interrupt key and returns user to the prompt.

Note! *letters can be typed either lowercase or uppercase.*

Main menu

Enter the **help** command to view a CLI main menu:

```
**************************************
                Main  menu
**************************************
 datetime                sub menu
 devmgmt                 sub menu
 ethswitch               sub menu
 network                 sub menu

 up
 help
 exit
-------------------------
```

Command	Description
up	Jump to previous level
help	Displays a list of available commands in level
exit	Exits the session

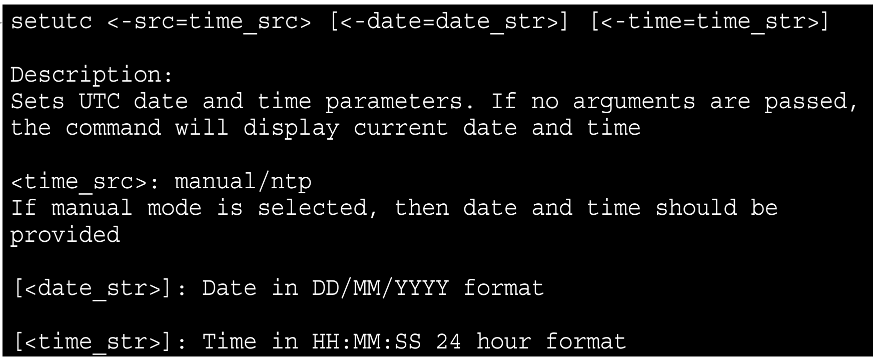
Datetime command

Enter the **datetime** command to view datetime menu:

```
**************************************
                datetime  menu
**************************************
 setutc

 up
 help
 exit
-------------------------
```

Entering **help setutc** displays a list of options for setutc command:

Use the **setutc** command to change device date and time settings.



```
setutc <-src=time_src> [<-date=date_str>] [<-time=time_str>]

Description:
Sets UTC date and time parameters. If no arguments are passed,
the command will display current date and time

<time_src>: manual/ntp
If manual mode is selected, then date and time should be
provided

[<date_str>]: Date in DD/MM/YYYY format

[<time_str>]: Time in HH:MM:SS 24 hour format
```

Devmgmt command

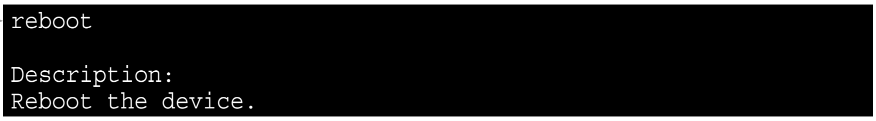
Enter the **devmgmt** command to view devmgmt menu:

```
**************************************
                devmgmt  menu
**************************************
 reboot
 softfactoryreset
 hardfactoryreset
 licenseupdate
 swversion
 swud
 getconf
 putconf

 up
 help
 exit
-------------------------
```

Available CLI commands in **devmgmt** menu. These commands allows you to manage device, as make factory resets, update firmware and save/restore device settings.

Entering **help reboot** displays information about the reboot command:

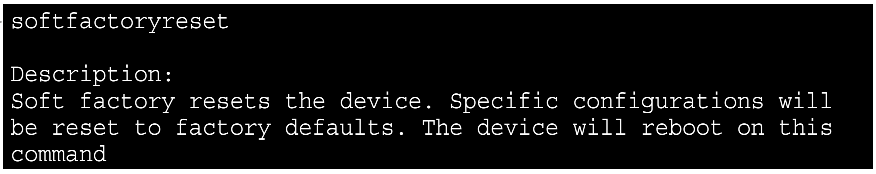
Use the **reboot** command to restart the device.



```
reboot

Description:
Reboot the device.
```

Entering **help softfactoryreset** displays information about the softfactoryreset command:

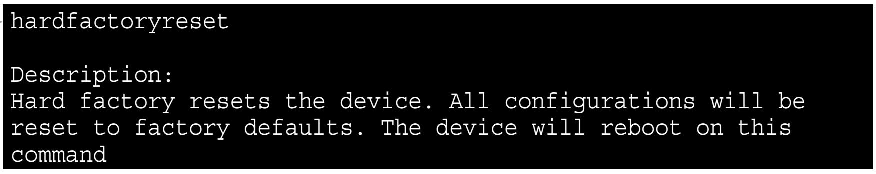
Use the **softfactoryreset** command to make soft factory reset to the device.



```
softfactoryreset

Description:
Soft factory resets the device. Specific configurations will
be reset to factory defaults. The device will reboot on this
command
```

Entering **help hartfactoryreset** displays information about the hartfactoryreset command:

Use the **hartfactoryreset** command to make hard factory reset to the device.



```
hardfactoryreset

Description:
Hard factory resets the device. All configurations will be
reset to factory defaults. The device will reboot on this
command
```

Entering **help licenseupdate** displays information about the licenseupdate command:

Use the **licenseupdate** command to activate a new licence to the device.

```
licenseupdate [<license_key>]

Description:
Update product license key. The license key will be validated
against device serial number before updating. The device
will reboot after successfully updating the license key. If
the licensekey is not provided, this command will print the
current license key

[<license_key>]: Product license key string. If this string is
not provided, current license key will be displayed

Example:
licenseupdate MPH-1A-E1CGAX-AXXAXXOX-
XXXXXXXX,HL00000000,0,EJPKOJ-XLJAYA-I72CA2
```

Entering **help swversion** displays information about the swversion command:

Use the **swversion** command to view the current firmware version of the device.

```
swversion

Description:
Prints the current software version
```

Entering **help swud** displays information about the swud command:

Use the **swud** command to change device's firmware.

```
swud <tftp link>

Description:
Downloads software image from tftp and update. Device will
reboot once the software image is downloaded successfully

<tftp link>: String of upto 128 characters with tftp://<ip_
address>/software_image format

Example:
swud tftp://192.168.36.148/tvelightimage.bin
```

Entering **help getconf** displays information about the getconf command:

Use the **getconf** command to download stored configuration from a TFTP - server.

```
getconf <-ip=server_ip> <-file=config_file_name>

Description:
Download configuration file from tftp server and restore
configurations. Device will reboot once the file is downloaded
successfully

Example:
getconf -ip=192.168.36.148 -file=tve.cfg
```

Entering **help putconf** displays information about the putconf command:

Use the **putconf** command to upload the current configuration to a TFTP - server.

```
putconf <-ip=server_ip> <-file=config_file_name>

Description:
Upload configuration file to tftp server for backup. The file
name can be chosen by the user

Example:
putconf -ip=192.168.36.148 -file=tve.cfg
```

Ethswitch command

CLI lets you manage device’s internal Ethernet switch. Enter the **ethswitch** command to view ethswitch menu:

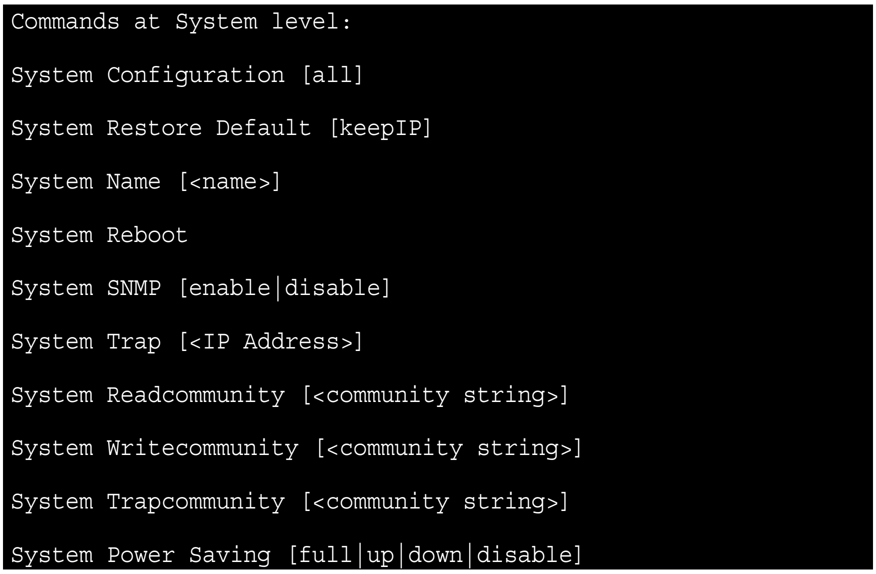
Use the **help** command to see information on a command (usage: enter “help + the specified command”, for example: **help help** displays information from help command.

```
**************************************
                ethswitch  menu
**************************************

help

Commands at top level:

System      - System commands

Console     - Console commands

Port        - Port commands

MAC         - MAC commands

VLAN        - VLAN commands

Aggr        - Aggregation commands

LACP        - IEEE 802.3ad Link Aggregation commands

RSTP        - IEEE 802.1w Rapid Spanning Tree commands

User Group  - User Group commands

QoS         - QoS commands

Mirror      - Mirror commands

IP          - IP commands

Dot1x       - Dot1x commands

IGMP        - IGMP Snooping commands

Debug       - Debug commands

>ENDOFCMD

-------------------------
```

These commands allows you to manage Ethernet Switch settings. To get more information about how to use a specific CLI command on the menu, enter help + command, for example: **port help** displays all commands at port level.

System command

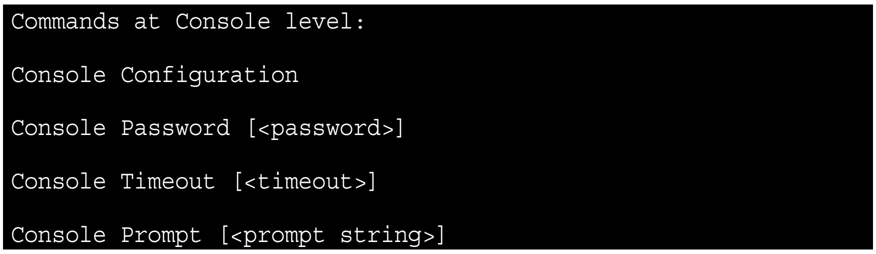
Enter the **system** command to go to **System** level:



```
Commands at System level:

System Configuration [all]

System Restore Default [keepIP]

System Name [<name>]

System Reboot

System SNMP [enable|disable]

System Trap [<IP Address>]

System Readcommunity [<community string>]

System Writecommunity [<community string>]

System Trapcommunity [<community string>]

System Power Saving [full|up|down|disable]
```

Console command

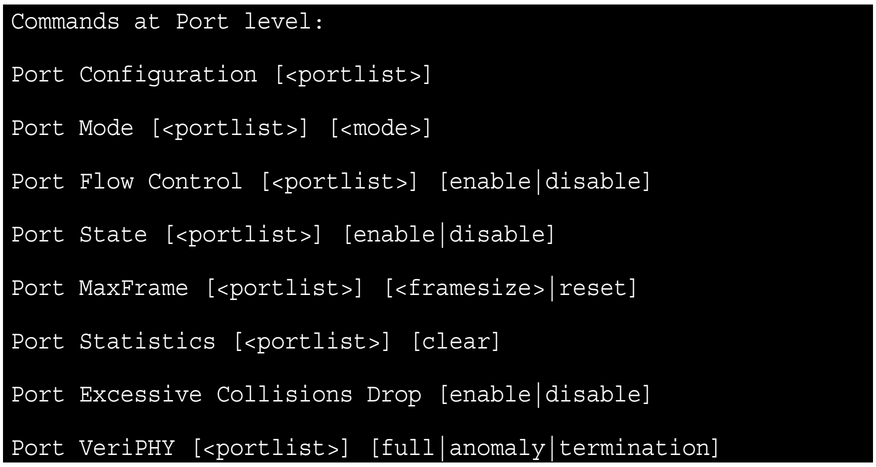
Enter the **console** command to go to **Console** level:



```
Commands at Console level:

Console Configuration

Console Password [<password>]

Console Timeout [<timeout>]

Console Prompt [<prompt string>]
```

Port command

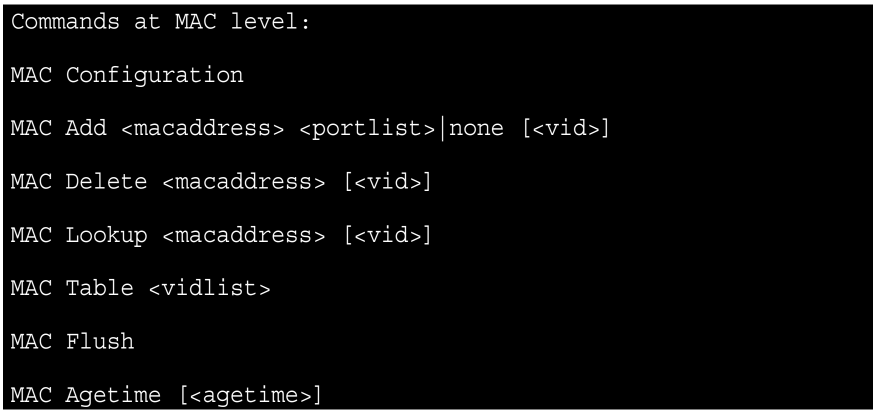
Enter the **port** command to go to **Port** level:



```
Commands at Port level:

Port Configuration [<portlist>]

Port Mode [<portlist>] [<mode>]

Port Flow Control [<portlist>] [enable|disable]

Port State [<portlist>] [enable|disable]

Port MaxFrame [<portlist>] [<framesize>|reset]

Port Statistics [<portlist>] [clear]

Port Excessive Collisions Drop [enable|disable]

Port VeriPHY [<portlist>] [full|anomaly|termination]
```

MAC command

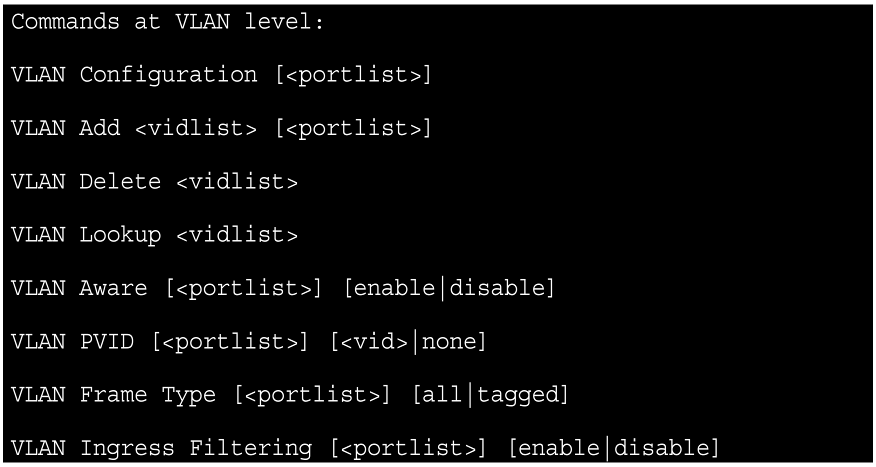
Enter the **mac** command to go to **MAC** level:



```
Commands at MAC level:

MAC Configuration

MAC Add <macaddress> <portlist>|none [<vid>]

MAC Delete <macaddress> [<vid>]

MAC Lookup <macaddress> [<vid>]

MAC Table <vidlist>

MAC Flush

MAC Agetime [<agetime>]
```

VLAN command

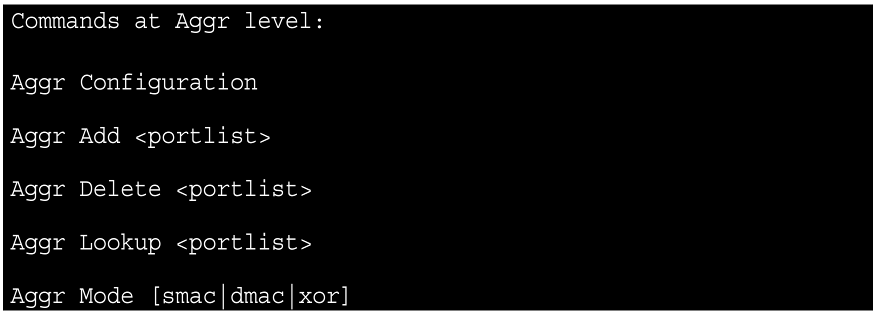
Enter the **vlan** command to go to **VLAN** level:



```
Commands at VLAN level:

VLAN Configuration [<portlist>]

VLAN Add <vidlist> [<portlist>]

VLAN Delete <vidlist>

VLAN Lookup <vidlist>

VLAN Aware [<portlist>] [enable|disable]

VLAN PVID [<portlist>] [<vid>|none]

VLAN Frame Type [<portlist>] [all|tagged]

VLAN Ingress Filtering [<portlist>] [enable|disable]
```

Aggr command

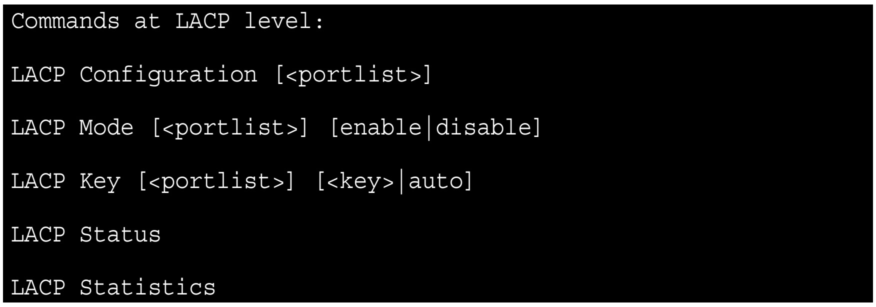
Enter the **aggr** command to go to **Aggr** level:



```
Commands at Aggr level:

Aggr Configuration

Aggr Add <portlist>

Aggr Delete <portlist>

Aggr Lookup <portlist>

Aggr Mode [smac|dmac|xor]
```

LACP command

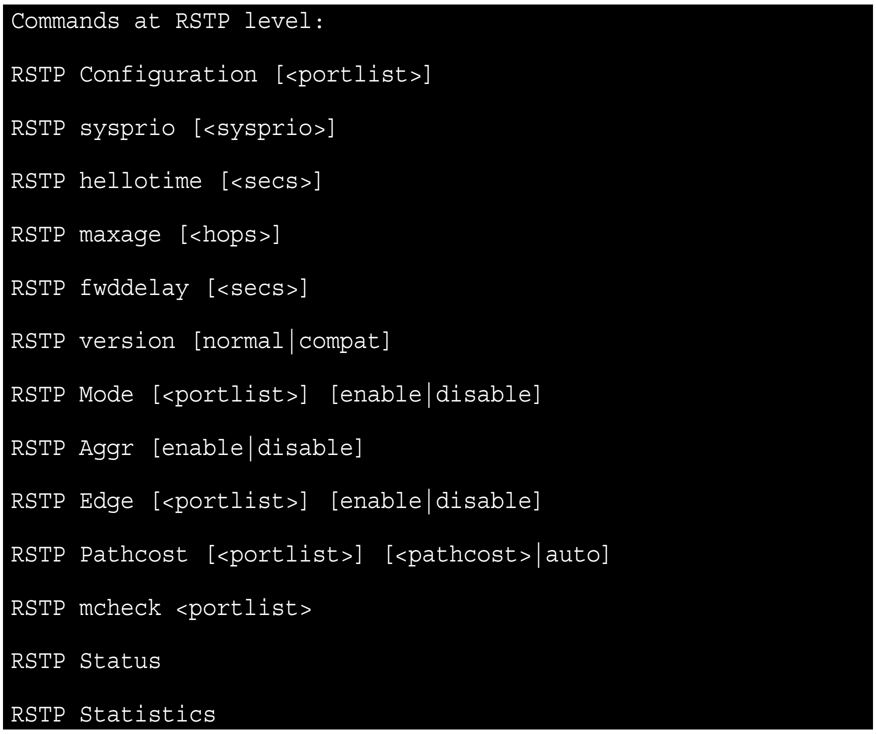
Enter the **lacp** command to go to system level:



```
Commands at LACP level:

LACP Configuration [<portlist>]

LACP Mode [<portlist>] [enable|disable]

LACP Key [<portlist>] [<key>|auto]

LACP Status

LACP Statistics
```

RSTP command

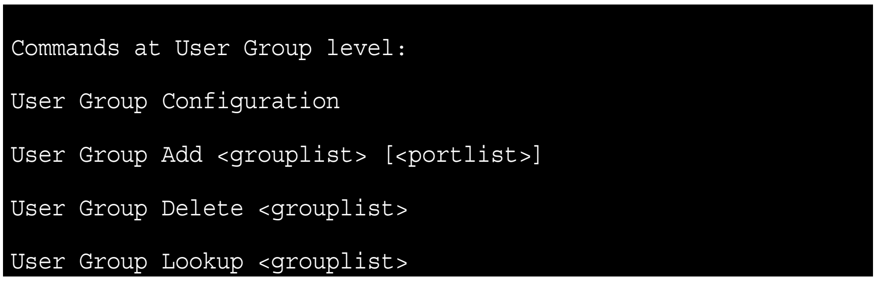
Enter the **rstp** command to go to console level:



```
Commands at RSTP level:

RSTP Configuration [<portlist>]

RSTP sysprio [<sysprio>]

RSTP hellotime [<secs>]

RSTP maxage [<hops>]

RSTP fwddelay [<secs>]

RSTP version [normal|compat]

RSTP Mode [<portlist>] [enable|disable]

RSTP Aggr [enable|disable]

RSTP Edge [<portlist>] [enable|disable]

RSTP Pathcost [<portlist>] [<pathcost>|auto]

RSTP mcheck <portlist>

RSTP Status

RSTP Statistics
```

User Group command

Enter the **user group** command to go to system level:



```
Commands at User Group level:

User Group Configuration

User Group Add <grouplist> [<portlist>]

User Group Delete <grouplist>

User Group Lookup <grouplist>
```

QoS command

Enter the **qos** command to go to console level:

```
Commands at QoS level:
QoS Configuration [<portlist>]
QoS Mode [<portlist>] [tag|port|diffserv]
QoS Default [<portlist>] [<class>]
QoS Tagprio [<portlist>] [<tagpriolist>] [<class>]
QoS DiffServ [<dscpno>] [<class>]
QoS Userprio [<portlist>] [<tagprio>]
QoS Storm Control [<traffic type>] [enable|disable] [<rate>]

<class> range: low|normal|medium|high
<traffic type>: Broadcast|Multicast|Flood Unicast
```

Mirror command

Enter the **mirror** command to go to system level:

```
Commands at Mirror level:
Mirror Configuration
Mirror Port [<port>]
Mirror Source [<portlist>] [enable|disable]
```

IP command

Enter the **ip** command to go to console level:

```
Commands at IP level:
IP Configuration
IP Status
IP Setup [<ipaddress> [<ipmask> [<ipgateway>]]] [<vid>]
IP Mode [enable|disable]
IP Ping [-n <count>] [-w <timeout>] <ipaddress>
IP Arp
IP Dhcp [enable|disable]
IP tftp [enable|disable]
IP tftpget server-ip filename
IP tftpput config|image|backup server-ip filename
```

Dot1x command

Enter the **dot1x** command to go to system level:

```
Commands at Dot1x level:

Dot1x Configuration

Dot1x Mode [enable|disable]

Dot1x State [<portlist>] [Auto|ForceAuthorized|ForceUnauthorized]

Dot1x Server [<IP Address>]

Dot1x UDP Port [<value>]

Dot1x Secret [<Shared Secret>]

Dot1x Statistics [<portlist>]

Dot1x Reauthenticate [<portlist>] [now]

Dot1x Parameters [<parameter>] [<value>]
```

IGMP command

Enter the **igmp** command to go to console level:

```
Commands at IGMP level:

IGMP Configuration

IGMP Status

IGMP Groups <vidlist>

IGMP Mode [enable|disable]

IGMP State <vidlist> [enable|disable]

IGMP Querier <vidlist> [enable|disable]

IGMP Router ports [<portlist>] [enable|disable]

IGMP Unregistered Flood [enable|disable]
```

Debug command

Enter the **debug** command to go to system level:

```
Commands at Debug level:

Debug Read Register <block> <subblock> <address>

Debug Write Register <block> <subblock> <address> <value>

Debug PHY Read <portlist> [<address>] [<page>]

Debug PHY Write <portlist> <address> <value> [<page>]

Debug Loopback [int|ext]
```

Network command

Enter the **network** command to view network menu:

```
**************************************
                network  menu
**************************************
 linkstatus
 linklevel
 ip
 hostname
 dns
 ntp

 up
 help
 exit
-------------------------
```

Use CLI commands in **network** menu to configure device IP settings.

Use the **linkstatus** command to see information from the network interface and link status.

Entering **help linkstatus** displays information about the linkstatus command:

```
linkstatus

Description:
Displays network interface and link status
```

Use the **linklevel** command to set link mode and mtu size.

Entering **help linklevel** displays information about the linklevel command:

```
linklevel [<-mode=mode_str>] [<-mtusize=mtu_size>]

Description:
Sets the link mode and/or mtu size.
mode_str: Can be one of the following:
       auto    : Auto negotiation
       100FD   : 100 mbps full duplex
       100HD   : 100 mbps half duplex

mtu_size: MTU size in bytes (Valid range: 64 to 1500)

If no arguments are passed, the command will display current
configuration
```

Use the **ip** command to change device IP settings.

Entering **help ip** displays information about the ip command:

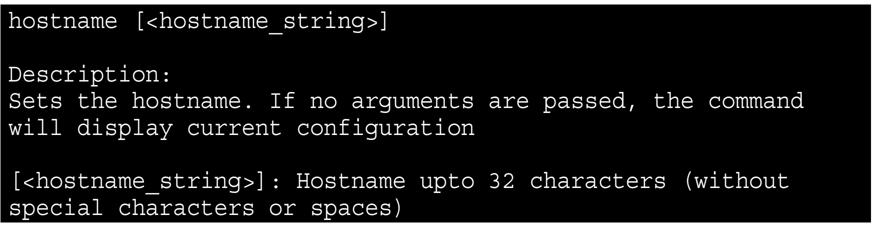
```
ip <-mode=ip_mode> [<-addr=ip_addr>] [<-mask=subnet>]
[<-gate=gateway>]

Description:
Sets the IP mode. Also sets IP address, subnet and gateway in
case of static IP mode only
If no arguments are passed, the command will display the
current configuration.

<ip_mode>: static / dhcp
If manual mode is selected, then ip address, subnet mask and
gate way also should be provided

[<ip_addr>]: IP address

[<subnet>]: Subnet mask

[<gateway>]: Default gateway

Caution: If ip address is changed, you might have to login
using new IP address. Change in IP address might make the
device in-accessbile from your network if configured to a
different subnet
```

An example how to change device IP address, subnet and gateway:

network
ip -mode=static -addr=172.31.252.13 -mask=255.255.0.0 -gate=172.31.2.1

Entering **help hostname** displays information about the hostname command:

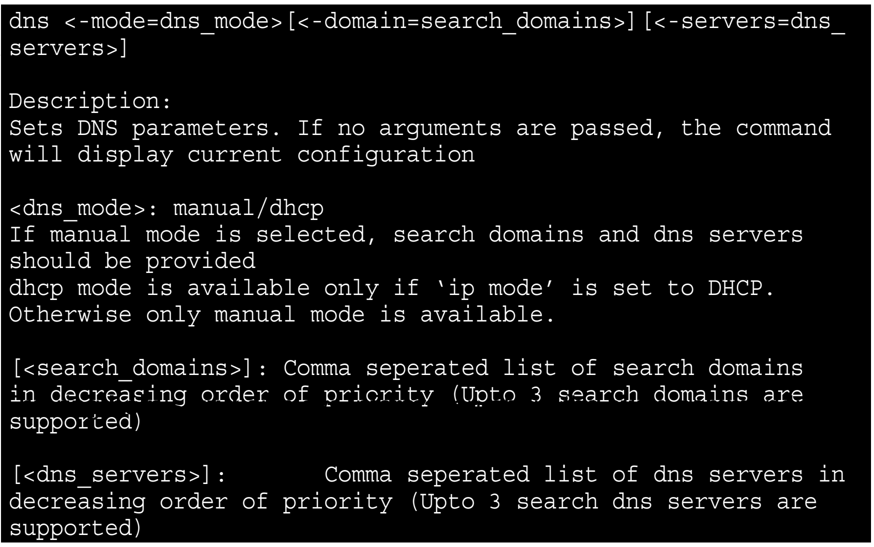
Use the **hostname** command to set a hostname to the device.



```
hostname [<hostname_string>]

Description:
Sets the hostname. If no arguments are passed, the command
will display current configuration

[<hostname_string>]: Hostname upto 32 characters (without
special characters or spaces)
```

Entering **help dns** displays information about the dns command:

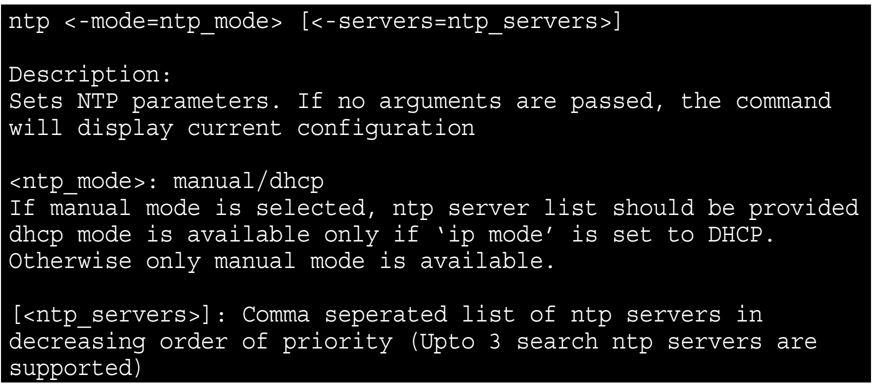
Use the **dns** command to set DNS parameters to the device.



```
dns <-mode=dns_mode>[<-domain=search_domains>][<-servers=dns_
servers>]

Description:
Sets DNS parameters. If no arguments are passed, the command
will display current configuration

<dns_mode>: manual/dhcp
If manual mode is selected, search domains and dns servers
should be provided
dhcp mode is available only if ‘ip mode’ is set to DHCP.
Otherwise only manual mode is available.

[<search_domains>]: Comma seperated list of search domains
in decreasing order of priority (Upto 3 search domains are
supported)

[<dns_servers>]:       Comma seperated list of dns servers in
decreasing order of priority (Upto 3 search dns servers are
supported)
```

Entering **help ntp** displays information about the ntp command:

Use the **swud** command to change device’s firmware.

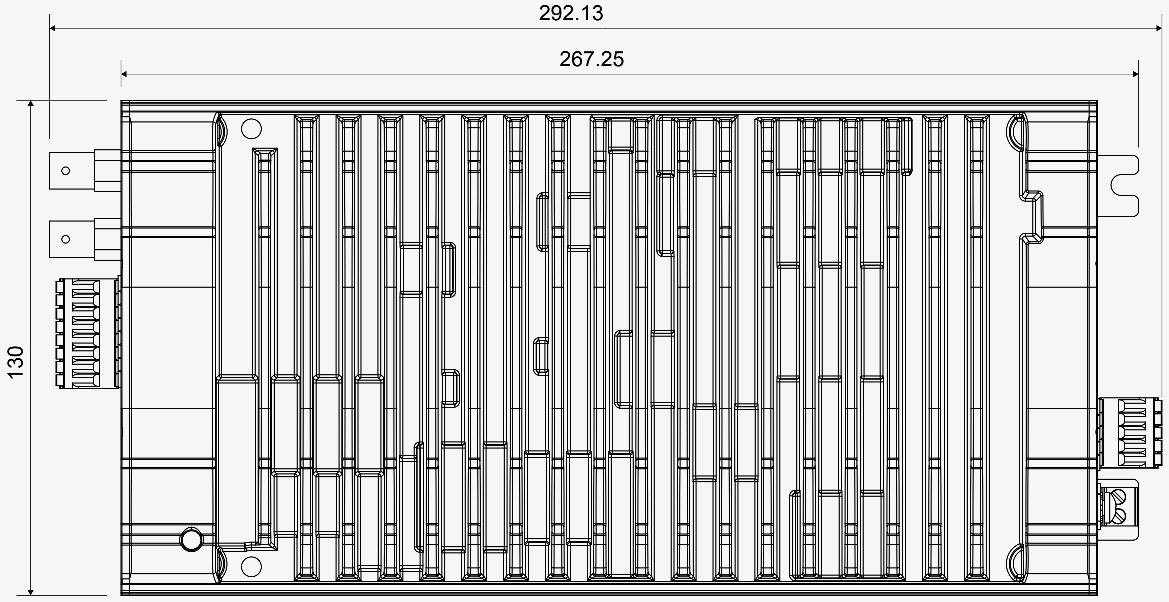


```
ntp <-mode=ntp_mode> [<-servers=ntp_servers>]

Description:
Sets NTP parameters. If no arguments are passed, the command
will display current configuration

<ntp_mode>: manual/dhcp
If manual mode is selected, ntp server list should be provided
dhcp mode is available only if ‘ip mode’ is set to DHCP.
Otherwise only manual mode is available.

[<ntp_servers>]: Comma seperated list of ntp servers in
decreasing order of priority (Upto 3 search ntp servers are
supported)
```

MPH200 specifications

Video	MPH241	MPH242
CVBS video input	1	2
HD-SDI video input	1*	-
Encoding channels	up to 4 or 1 HD*	up to 4
Total streams	up to 8 or 1 HD*	up to 6
Coding	H.264/MJPEG/MPEG-4/MPEG-2*	
Resolution	QCIF/CIF/2CIF/4CIF, ½D1/D1/720p*/1080i*	QCIF/CIF/2CIF/4CIF, ½D1/D1
Frame rate (fps)	1...25 PAL, 1...30 NTSC	
Max. Performance (25/30 fps)		
H.264, MJPEG, MPEG-4*, MPEG-2*	4 x 4CIF/D1 or 1 x 720p/1080p* or 1 x 720p + 1 x 4CIF/D1*	2 x 4CIF/D1 (per video input)
ONVIF	Yes	
SNMP*	Yes	
Motion detection	Yes	
Camera tampering	Yes	
Text overlay	Yes	
SAP	Yes (Session Announcement Protocol)	
NTP	Yes (Network Time Protocol)	
RTSP	Yes (Real Time Streaming Protocol)	
Data channels	2	
Standard	Data 1: RS422/485, Data 2: RS232	
Audio channels	2	
Coding	G.711. G.726, AAC-LC, AAC-HE*	
Contact closures	2 in, 1 out	
Ethernet ports	4	
	Gigabit Ethernet (electrical or optical)	
VLAN	16 ids	
Multicast	IGMP v1, v2	
Link redundancy	STP/RSTP	
Protocols	RTP, UDP, TCP, IP, HTTP, DHCP, SSH, Telnet, DHCP, DNS, ZeroConf, ICMP, ARP, QoS	
SFP support*	Yes	
Management	WebUI / SNMP / CLI (password protected user groups with different user levels, CLI via serial or SSH connection)	
Size (H x W x D)	52.5 x 130 x 254	
Operating temperature	-34...+74 ºC (-29...+165 ºF)	
Power consumption	13 W	
Power Over Ethernet	PoE+, 802.11at, 15W (class 4)	

* = option



TELESTE

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